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JOINT TARGETING:
WHAT'S STILL BROKE?

BY
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Contents

	<i>Page</i>
DISCLAIMER	ii
TABLE OF FIGURES	v
TABLE OF TABLES.....	vi
TABLE OF DIAGRAMS.....	vii
ABSTRACT	viii
ABOUT THE AUTHOR.....	ix
ACKNOWLEDGMENTS.....	x
INTRODUCTION.....	1
FRAMING THE ISSUE	2
Purpose Of This Study	3
Methodology	4
Assumptions and Limitations	4
UNDERSTANDING THE JOINT TARGETING PROCESS	6
Objectives and Guidance	10
Target Development.....	11
Weaponering Assessment	13
Force Application.....	14
Execution Planning / Execution.....	15
Combat Assessment.....	15
Scientific Problem Solving: An Intellectual Foundation	17
Summary.....	18
JOINT TARGETING IN MAJOR THEATER WAR: A MIRAGE IN THE DESERT.....	20
Joint Targeting: Operation Desert Storm.....	21
What did joint targeting accomplish?	26
Summary.....	48
JOINT TARGETING IN LIMITED THEATER WAR: <i>BOMBING FOR PEACEFUL PURPOSES</i>	50

Joint Targeting In Deliberate Force	51
Joint Targeting Deficiencies	58
Summary	68
JOINT TARGETING IN SMALL SCALE CONTINGENCY OPERATIONS:	
<i>MESSAGE IN A MISSILE</i>	71
Joint Targeting Deficiencies	78
Summary	86
CONCLUSION AND RECOMMENDATIONS	
Causes	87
Causes	93
Causes	96
Recommendation	97
BIBLIOGRAPHY	99

Table of Figures

FIGURE 1. Open System.....	18
FIGURE 2. Core Elements of Joint Targeting.....	19
FIGURE 3. The Joint Targeting Cycle.....	20
FIGURE 4. Overview of Joint Targeting During the Gulf War.....	36
FIGURE 5. GULF WAR TARGETING/BDA RELATIONSHIP.....	57
FIGURE 6. Operation Deliberate Force Targeting Evolution.....	64
FIGURE 7. Joint targeting during Desert Strike.....	79

Table of Tables

TABLE 1. Joint targeting/Scientific Problem-Solving correlation28
TABLE 2. Reported Iraqi Equipment Loses: As of 23 Feb 1991.....54

Table of Diagrams

DIAGRAM 1. Iraqi No-fly Zones.....64

Abstract

Joint targeting is a process that synchronizes all operational level targeting activities in support of the theater commander. The centerpiece of operational targeting is the joint targeting cycle, which is a six-step problem-solving methodology designed to derive rational targeting solutions from the theater commander's objectives and guidance. The purpose of this study is to expose the recurring deficiencies that pervade the joint targeting cycle so that meaningful steps may be undertaken to improve the process. This study analyzes the joint targeting cycle from the perspective of three distinct scenarios: (1) major theater war (DESERT STORM), (2) limited theater war (DELIBERATE FORCE), and (3) a small-scale contingency operation (DESERT STRIKE). Following a brief overview of the targeting architectures in each scenario, the investigation takes aim at the deficiencies that degraded the effectiveness of the joint targeting cycle. The evidence uncovered in the three case studies leads to the following conclusions: first, the inability to translate objectives and guidance into congruent targeting activities is a recurring deficiency within the joint targeting process; second, target analysis inadequately supports the joint targeting process; last, combat assessment does not provide meaningful and timely bomb damage assessment (BDA). Given the overwhelming military advantage the US currently enjoys, these joint targeting deficiencies, though serious, do not seem to be catastrophic. However, as the military "build down" continues to erode force structure, US military strength will become less of joint targeting deficiencies. Therefore, if the US is to preserve its military pre-eminence well into the next century, the problems that currently plague the joint targeting process must necessarily be confronted.

About The Author

Major Matthew P. McKeon graduated from the US Air Force Academy in 1983 with a Bachelor of Science in Civil Engineering. Following UPT in 1984, he went on to fly the F-4E at Seymour Johnson AFB where he became a wing SEFE. In 1989, Major McKeon was reassigned as a USAF/RAF exchange officer at RAF Chivenor, United Kingdom, where he was an instructor and flight commander on the Hawk T1A. Following that three-year assignment, Major McKeon was sent to Tonopah Test Range where he qualified in the F-117. Following a wing relocation to Holloman AFB, he became a squadron ADO and SEFE until his reassignment to the Joint Special Operations Command (JSOC) at Fort Bragg in 1995. While at JSOC, he worked as a Current Operations action officer and fire support officer in the J3 Directorate. Major McKeon is a senior pilot with over 2,900 flying hours in three types of aircraft. Academically, Major McKeon earned his Masters in Management from Troy State University in 1994. Professionally, he completed Squadron Officers School, attended the Armed Forces Staff College in 1996, Air Command and Staff College in 1997, and the School of Advanced Airpower Studies (SAAS) in 1998. Upon graduation from SAAS in June 1999, he will be assigned to the 49th Fighter Wing at Holloman AFB, New Mexico.

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Most importantly, I would like to thank my wife Lisa and our children, Andrew and Kate, for the sacrifices they made so that I could complete this project.

CHAPTER 1

INTRODUCTION

Well before the first salvo of cruise missiles reached Baghdad on the night of 16 December 1998, US Central Command (CENTCOM) began work on a list of Iraqi targets to strike during Operation DESERT FOX. The US decision to unleash military force against Iraq concluded an unsuccessful two-month diplomatic effort aimed at convincing the Iraqi regime to comply with United Nations weapons inspections. To claim a place on the DESERT FOX strike list, each target had to navigate a gauntlet of objectives, guidance, assessments, and a host of Washington-imposed restrictions.¹ CENTCOM eventually nominated 100 aim-points for the operation and forwarded the list to the national command authority (NCA) where it was approved, target by target.²

Television coverage of DESERT FOX was spectacular as viewers witnessed the joint targeting list unfold first hand. But initial elation over the long-in-coming operation quickly turned sour due to media criticism of the target list. Published reports claimed that 49 of the targets were directly related to the Iraqi regime and a further 34 were associated with air defenses, despite the stated aim of “degrading” Iraq’s weapons of mass destruction (WMD) capacity.³ The relatively small percentage of actual WMD targets fueled speculation that a different goal was in the works. Regardless of how history ultimately records the merits of Operation DESERT FOX, one thing seems clear: the stakes riding on joint targeting were very high indeed.

¹ William M. Arkin, “Desert Fox Delivery Precision Undermined Its Purpose,” *Washington Post*, 17 January 1998, B1.

² John Diamond, “Commander makes sure mission’s goal is clear,” *Detroit News*, 27 December 1998, 15A.

³ Arkin, B1.

FRAMING THE ISSUE

In 1986, the United States Congress unveiled a promising new blueprint for the conduct of joint military operations—the Goldwater-Nichols Department of Defense Reorganization Act. Responding to the disturbing operational failures and lack of teamwork that occurred during Operations RICE BOWL and URGENT FURY, the authors sought to mandate “jointness” as a fundamental philosophy in warfighting, thus creating a more potent military machine.⁴ Since that time, the US armed forces have made considerable progress repairing inter-service fault lines and implementing the “jointness” envisaged by the Goldwaters-Nichols Act. The progress has been evident in successes in Panama, Kuwait, and Bosnia-Herzegovina. Despite the impressive headway, however, lingering problems continue to plague various aspects of joint military operations. Unifying efforts in the areas of doctrine and training have yet to erase stubborn obstacles that persist in key areas. Developing an effective approach to joint targeting is one of the most important of these remaining challenges.

There are few issues in the joint arena that generates more discord among warfighters than targeting. In theory, joint targeting is a lucid process—well grounded in principles of logic. Ideally, joint targeting is a collaborative effort that harnesses expertise from the joint force and various national support agencies to ensure that targeting effects are congruent with theater objectives. The six steps that constitute the joint targeting cycle are predicated on classic scientific problem-solving methodology and, in theory, help guarantee the intellectual integrity of the process.⁵ In practice, however, joint targeting regularly appears as anything but rational. Despite its apparent simplicity, the joint targeting process is largely misunderstood and often diverted by

⁴ Operations RICE BOWL (Iranian Hostage Rescue attempt) and URGENT FURY (Liberating students in Grenada) were by no means the sole instigators for the Goldwater-Nichols Act. Congress had observed a pattern of failures in inter-service cooperation including the Vietnam War, the MAYAGUEZ (hostage rescue effort) and Beirut (bombing of US Marine Corps barracks) that were detrimental to the nation’s defense and collectively played a pivotal role in the decision to reorganize the Department of Defense. In the end, Operations RICE BOWL and URGENT FURY merely represent the culmination of congressional frustration regarding inter-service non-cooperation.

⁵ Lt Col Paul T. Dolson, “Warfighting Solutions: Finding the Answers,” briefing slides, US Atlantic Command J-35, 18 December 1998.

contextual factors that violate its internal integrity and invariably cause contaminated results. In fact, the joint targeting cycle can become so distorted that it ceases to exist as a logical process. In short, joint targeting looks sensible on paper but frequently deviates from this image in action.

Purpose Of This Study

The luxury of overwhelming strength the United States armed forces have enjoyed throughout much of this century has been a blessing. Since emerging from WWII as a world super-power, US military commanders have seldom been forced to engage an enemy without a decided advantage in combat power. During the Gulf War, for instance, the US-led coalition assembled an air armada of nearly 1,800 combat aircraft, land forces numbering 540,000, and seven carrier battle groups (CVBGs), while the opposing Iraqi forces could muster only 700 combat aircraft, 336,000 soldiers, and a small coastal navy.⁶ With numerical superiority across the board and a clear qualitative edge in equipment, the outcome of Operation DESERT STORM was never in doubt. The fact that Iraq chose to fight the Gulf War on Coalition terms further contributed to the military victory. Overwhelming force, however, can mask significant deficiencies in the conduct of war—deficiencies that may not become apparent until overwhelming force is no longer available. By failing to analyze critically the processes that define US military power and failing to implement corrective actions when required, overwhelming force may quickly become a necessity for successful US military operations. Joint targeting is one such process whose deficiencies should no longer be overlooked.

Since the Gulf War, monographs addressing targeting have, for the most part, concentrated on who should control and direct the joint targeting cycle and what organizational structures should support the process. However, beneath the veneer of these command and control issues lurk other deficiencies that are too serious to be left smoldering in the dusty annals of an after-action-report archive. The purpose of this study, therefore, is to expose the recurring deficiencies that reside in the process of joint targeting.

⁶ Eliot A. Cohen, et al., *Gulf War Air Power Survey, Summary*, (Washington D.C. GPO: 1993), 7-8.

Methodology

This study seeks to identify the major targeting failures that continue to hamper joint military operations and the associated causes of these deficiencies. To do this, Chapter 2 reviews the nature of joint targeting and then describes in detail the joint targeting process as it is taught at the Joint Targeting School (JTS). This targeting process is the joint standard, which is sanctioned by both the Joint Warfighting Center and US Atlantic Command (USACOM). In addition, Chapter 2 includes a brief discussion regarding the intellectual underpinning of the joint targeting process—the six-step scientific problem-solving methodology. This methodology will constitute the intellectual template for evaluating the evidence throughout the study.

Chapters 3 through 5 present targeting case studies that span a broad spectrum of conflict. Chapter 3 outlines the targeting process used during Operation DESERT STORM to provide a major theater war (MTW) perspective. Chapter 4 investigates the targeting process used during Operation DELIBERATE FORCE, which yields a limited theater war (LTW) viewpoint. Finally, Chapter 5 examines the targeting issues in the two-day contingency operation known as DESERT STRIKE. Examining three distinct types of operations should broaden the relevance of the conclusions.

Each case study will confront the following questions: (1) what was the targeting process employed, (2) what did the targeting process accomplish, and (3) to what extent did the targeting process conform to the scientific problem-solving framework? Notable exceptions in the problem-solving methodology will be earmarked as a joint targeting deficiency, followed by an explanation of the consequences and the relevant causal factors. Chapter 6 will then summarize the major targeting deficiencies, link their causal factors to suggestive concluding themes, and offer corrective action recommendations.

Assumptions and Limitations

The preponderance of US military campaigns this century have been characterized by joint operations. With joint legislation now firmly entrenched, joint doctrine gaining notoriety and institutional structures in place to conduct joint operations, “jointness” in the Department of Defense appears to be a growth industry. Therefore, it

is reasonable to assume that most future US military campaigns will likely be joint, hence requiring some form of targeting process that is compatible with joint operations.

A quick scan of joint doctrine reveals the six-step joint targeting process referred to in a number of publications.⁷ The joint document intended to be definitive on the targeting process, Joint Pub 3-60 (DRAFT) “Doctrine for Joint Targeting”, is currently undergoing initial development. Early indications are that this targeting document will also endorse the six-step process, but may alter the names of the steps. With the bulk of evidence leaning in its direction, it seems prudent to assume the continued use of the six-step targeting process in joint warfighting.

The analytical spotlight for each case study will focus on the organization most responsible for conducting operational level targeting. This, however, does not limit the exploration of causal factors to only those sources internal to the particular targeting unit. In some cases, targeting deficiencies have been traced to the strategic level of war, far afield of the joint targeting efforts at the theater level. Where relevant, these excursions provide a more accurate accounting of the deficiencies that characterize the joint targeting process.

Although targeting techniques differ among the various service doctrines, evaluating these contrasting viewpoints goes beyond the bounds of this study; although it bears mentioning that despite the divergence in packaging, service doctrine appears to converge in rational content. Finally, this thesis will remain focused on process issues relating to joint targeting and will refrain from engaging command and control turf battles that frequently pervade such discussions.

⁷ Joint Pub 3-56.1, *Command and Control of Joint Air Operations*, Joint Pub 3-09, *Doctrine for Joint Fire Support*, and Joint Pub 2-01.1, *JTTP for Intelligence Support for Targeting*, all refer to the six-step joint targeting process.

CHAPTER 2

UNDERSTANDING THE JOINT TARGETING PROCESS

The selection of target systems whose neutralization or destruction will achieve the desired operational and strategic objectives has seldom, if ever, been an easy or trivial matter.

— Gulf War Air Power Survey

At first glance, targeting can appear as an intuitive process of selecting and destroying enemy targets to serve some useful military purpose. Sadly, this impression has emboldened many a part-time targeting “expert” into making decisions that have often defied rationality. Though the “Tuesday luncheons” during the Vietnam War readily come to mind, countless examples exist in other military operations that have strayed from sound reasoning.⁸ Targeting is a military discipline—not a casual undertaking—that blends rigorous scientific analysis, a rich understanding of weapons effects, and operational judgement into a coherent process.

Targeting is “the analysis of enemy situations relative to the commander’s mission, objectives, and capabilities at the commander’s disposal, to identify and nominate specific vulnerabilities that, if exploit, will accomplish the commander’s purpose through delaying, disrupting, disabling, or destroying enemy forces or resources critical to the enemy.”⁹

⁸ Adm U.S.G. Sharp, *Strategy for Defeat: Vietnam in Retrospect*, (Presidio Press, Novato, CA, 1998), 86. “The final target decision on what targets were to be authorized [in Vietnam], the number of sorties allowed, and in many instances even the tactics to be used by our pilots, was made at a Tuesday luncheon in the White House attended by the President, the Secretary of State, the Secretary of Defense, Presidential Assistant Walt Rostow, and the Presidential Press Secretary.”

⁹ Joint Pub (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 23 March 1994, 531. Joint doctrine also offers a second definition: “The process of selecting targets and matching the appropriate response to them, taking account of operational requirements and capabilities.” Joint Pub 3-60 (DRAFT), *Doctrine for Joint*

Targeting is intrinsic to all military operations—it occurs at every level of command and is not partial to any particular weapons platform, automated support system, service, or theater of operations.¹⁰ At the operational level of war, the joint targeting process vertically aligns and horizontally unifies all targeting activities for the theater commander. It translates the commander’s objectives and guidance into synchronized military actions by fusing all component-level targeting architectures, hence promoting economy of force. The mechanism used to do this is the joint targeting cycle.

In essence, the joint targeting cycle is a problem-solving road map designed to guide the practitioner to viable targeting solutions; it is important for three reasons. First, it provides structural integrity for the targeting process by articulating the essential actions required to reach appropriate targeting solutions.¹¹ The cycle also provides a rational framework for joint targeting by specifying the desired order of each step, thus ensuring a logical correlation between the stated objectives and the targeting results.¹² Finally, the targeting cycle provides a practical tool for educating and training the joint community. Overall, the joint targeting cycle is a useful aid to decision-making and is applicable at any level of conflict regardless of the warfighting means available.¹³

In simple terms, the joint targeting cycle resembles an open-loop system with an integrated feedback mechanism (see Figure 1). Objectives and guidance enter the system as the input. The cycle then develops a list of supporting targets, applies lethal or non-lethal force to the targets, and assesses the effects of the force applied under the guidance

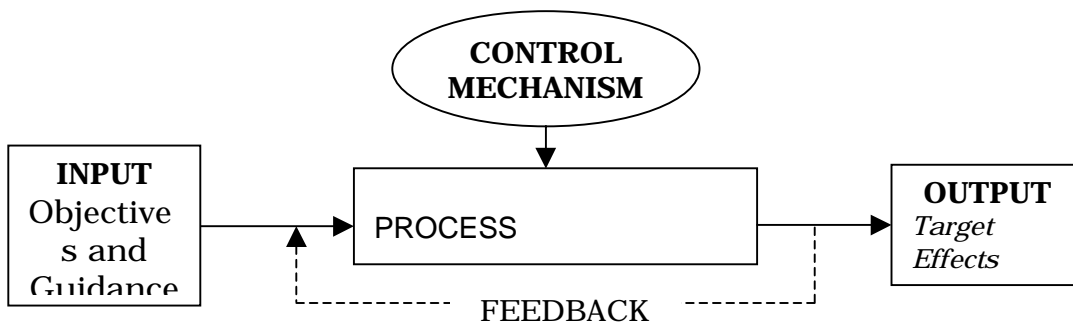
Targeting, is the first JP specifically dedicated to joint targeting and offers the following targeting definition: “The process of detect, select, and prioritize targets, match the appropriate action, and assess the resulting effects based on the commander’s objectives, guidance, and intent.” This discussion is provided not to advocate a particular definition but to point out the varying definitions of targeting that pervade current Joint doctrine.

¹⁰ Calvin W. Hickey, “The Atlantic Command Targeteer’s Book of Unclassified Readings” (US Atlantic Intelligence Command internal training document), III-1.

¹¹ Hickey, III.1.

¹² Hickey, III.1

¹³ Joint Targeting School, *Student Guide*, 25 March 1997, 9.



14

Figure 1. Open system

of a control mechanism. In each case, target damage is evaluated relative to the desired effect. Those targets that achieved the desired effect exit the system as output while those aim-points that do not are recycled back into the joint targeting process via the feedback loop. Also included in the feedback mechanism are those targets that, by design, receive temporal damage. These targets are recycled to allow the process to monitor target status for additional servicing requirements.

At its core, the joint targeting cycle is composed of operations, intelligence, and targeteering personnel fused in purpose, action, and time. The core elements are interdependently linked with each playing a specific leadership role during the joint targeting cycle (see Figure 2). Following the Gulf War, Lt Gen “Buster” Glosson reflected on this relationship from an airman’s perspective: “Airpower is targeting and targeting is intelligence.”¹⁵ Though this statement is true, it can be misleading. Joint targeting is not the sole proprietor of airpower. Joint targeting is team targeting—it must harness the planning expertise and available resources from *all* components in order to

¹⁴ This illustration represents a way of looking at the functional relationships within an on-going system. Authors of the book, *Management Systems: Conceptual Considerations*, describe an open system as “importing resources from the environment, transforming them into some useful output, and exporting the output into the environment.” The open system analogy draws many parallels with the joint targeting process, making it a useful illustrative tool.

¹⁵ Maj John R. Glock, “The Evolution of Air Force Targeting,” *Airpower Journal*, vol. VIII, no. 3 (Fall 1994): 27.

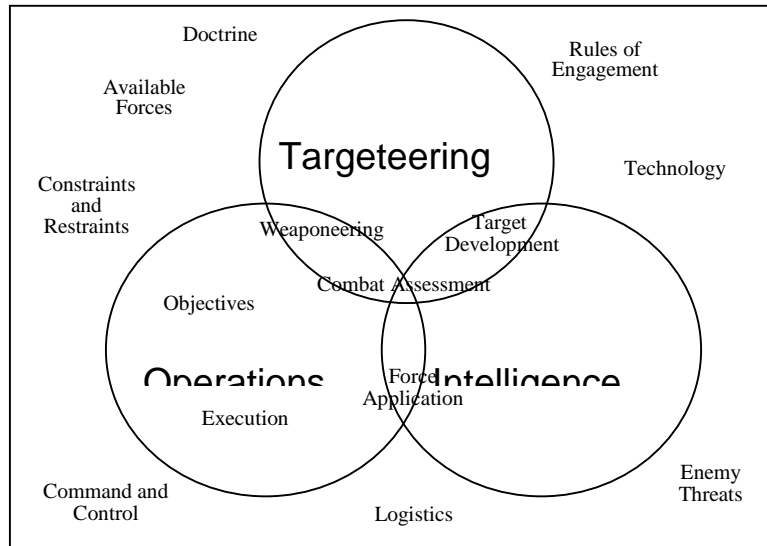


Figure 2. Core elements of joint targeting⁹

achieve synergy in execution. For this reason, each warfighting component must devote subject matter expertise to the core elements of joint targeting to ensure their capabilities are fully exploited.

The joint targeting cycle features six inter-related steps. Although the steps are depicted consecutively, in practice the joint targeting cycle is both iterative and bi-directional.¹⁶ This flexibility allows target planners to refine their understanding of the mission while testing numerous weapons and delivery platform options before committing to a single solution. Typically, each step in the cycle is being performed simultaneously, sometimes at different locations. It is not unusual, for instance, to find target development and combat assessment functions dislocated from the other planning steps. However, the process is coherent in that each target logically progresses through the targeting cycle as if on an assembly line, where something is added at every station (a weapon, a delivery platform, kinetic energy, etc). Paramount to this methodical process is objectives and guidance determination, which should initiate all targeting efforts.

¹⁶ Joint Targeting School, *Student Guide*, 25 March 1997, 9.

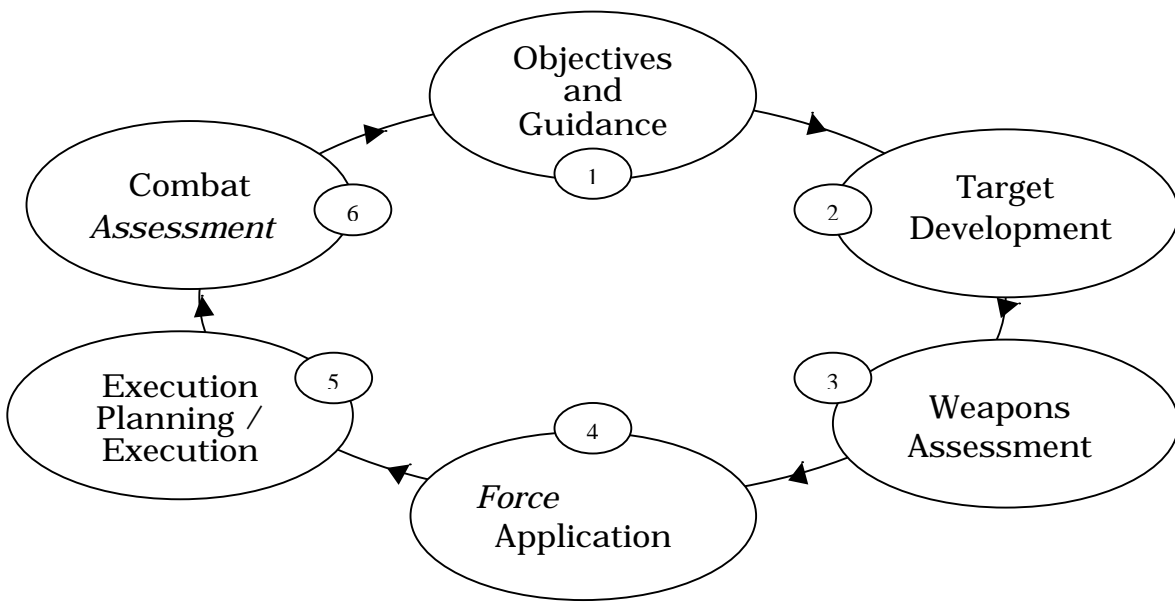


Figure 2. The Joint Targeting Cycle

Objectives and Guidance

Without question, the most important step in the joint targeting cycle is objective and guidance determination—understanding what the commander wants to achieve and why. The responsibility for objectives and guidance determination resides primarily with operations personnel.¹⁷ Political objectives feed into military objectives, yielding targeting tasks that form the impetus for the joint targeting cycle. To be most effective in this regard, military objectives should be observable, measurable, attainable, and logically guide the targeting process to the desired end-state. An objective is considered observable if it strives for a visible change in the enemy’s behavior.¹⁸ For example: “Reduce the enemy’s capacity to produce electricity by 75 percent for a period of three months.” Next, the change in enemy behavior must be quantifiable in some manner.¹⁹

¹⁷ Operations personnel include, but are not limited to regional command J-3/5 personnel, US Army Corps and Marine Expeditionary Force (MEF) G-3/5 personnel, Numbered Air Force A-3/5 personnel, and Numbered Fleet N-3/5 personnel.

¹⁸ Hickey, IV.2.

¹⁹ Hickey, IV.2.

For instance: “Reduce the enemy’s capacity to produce electricity *by 75 percent for a period of three months.*” Finally, the objective should be attainable, which means the methods employed must be able to achieve the object with the available resources while adhering to the parameters set forth in the guidance (i.e. constraints and restraints).²⁰ Objectives such as “win the war,” “maximize physical damage,” or “send a message” are all actual examples of military objectives that woefully fail to satisfy this criteria.²¹ A military operation that is subjected to such ill-defined objectives may jeopardize the joint targeting cycle and risk mission failure.

Objectives and guidance define the purpose and scope for all targeting activities within the joint targeting cycle. Objectives help form a basis for target analysis and provide both the justification for aim-point selection and the means to prioritize the targets. Objectives also help determine collection priorities, thus ensuring the optimal use of limited intelligence, surveillance, and reconnaissance (ISR) resources.²² In addition, objectives resolve target damage criteria, thus enabling planners to select the proper weapon, delivery platform, and execution method. Finally, this step establishes measures of effectiveness for the joint targeting cycle that ultimately dictates when the desired end-state has been achieved.²³ To serve the joint targeting process properly, objectives and guidance should be disseminated throughout all levels of planning (theater, component, combat unit) to unify targeting activities under a common purpose.

Target Development

The selection of targets to satisfy theater objectives and guidance has never been a trivial matter in warfare; nor has it been easy. The overall intent of target development is to derive from the commander’s objectives and guidance a list of prioritized targets with associated aim-points and damage requirements. Target development is a systematic investigation of all potential enemy systems to determine where and to what extent military force should be applied to achieve the stated objectives.

²⁰ Hickey, IV.2.

²¹ Calvin Hickey interview with author, 14 January 1999.

²² Joint Targeting School, *Student Guide*, 25 March 1997, 10.

²³ Joint Targeting School, “Joint Targeting Definition and Process,” briefing slides, 14 January 1999.

Target analysis starts the process by determining which enemy systems can support the objectives and guidance. The most appropriate enemy systems are then categorized into basic components (i.e. nodes, internal linkages, and external connections to other enemy systems) using a process called nodal analysis. Target history folders, functional analyses, orders of battle, threat assessments, detailed installation databases, and intelligence studies all funnel key information into the analysis to determine the critical nodes within the enemy's system. Targeteers should combine this military intelligence with an eclectic view of the target set so that the full implications of attacking a particular node can be anticipated before execution. The targeteer then analyzes each critical node to determine the appropriate level of damage required to satisfy the objectives. Emphasis is placed on creating the desired effects without reference to any specific weapon or resource. Unconstrained planning is important because personnel conducting the damage requirements may not have a full appreciation of friendly combat capabilities.

The next step in target development is target validation. A valid target is one that supports objectives and guidance; contributes to the enemy capability to wage war; is operational, significant, permissible under Law of Armed Conflict (LOAC); and complies with Rules of Engagement (ROE).²⁴ Targets not meeting all of these requirements are typically withheld from the target list, but may join a list of restricted or prohibited targets.

The final step in target development consolidates the validated targets into a prioritized list. Each critical node is rank-ordered according to a numerical score that is derived from quantitative and qualitative analyses. Quantitative analysis objectively determines how much of the enemy system (in percent) a critical node can affect. Qualitative analysis, which is subjective in nature, measures the impact a critical node will have on the enemy system's functionality. The resulting list of prioritized targets is not a dogmatic mandate for execution. Rather, it represents targeting options arranged in relative importance based on the characteristics of a certain phase of the campaign.

²⁴ Joint Targeting School, *Student Guide*, 25 March 1997, 10-11.

Weaponneering Assessment

This step is perhaps the least understood of the entire joint targeting cycle. Weaponneering is not synonymous with targeting, nor is it a substitute for objective and guidance determination or target development activities.²⁵ The intent of weaponneering assessment is to match the desired level of damage for each target on the prioritized target list with the right type and quantity of weapon. To optimize targeting solutions, weaponneering must be unconstrained in its search, but realistic in its selection—avoiding any preconceived notions regarding a particular weapon but remaining conscious of ordnance availability, enemy defenses, target vulnerabilities, and systems accuracy.

For lethal ordnance, weapons assessments give an estimate of the expected performance (probability of damage— P_D) of a nominal weapon in an infinite number of identical trials. P_D is presented as a numerical value and represents the chance of inflicting the desired damage on the target—it does not predict whether attacking a particular target will actually achieve the objective. For this reason, P_D should be used in conjunction with other criteria when making weaponneering comparisons. Weaponneering assessments for non-lethal force applications, on the other hand, typically identify only the friendly resource required to produce the desired effect. For instance, Electronic Warfare, Information Operations, and Psychological Operations assets often do not lend themselves to P_D considerations and are usually employed based on their ability to harass, deceive, jam, suppress, disrupt, and deny enemy capabilities.²⁶

Collateral damage and time requirements frequently influence the weaponneering process. Weaponneering assessments must be alert to collateral damage issues at or near the target that could potentially violate the commander's guidance or other restrictions. In this case, weaponneering may reveal the need to seek amended guidance or dictate employment tactics to prevent a costly mistake. In addition, time constraints may sometimes force weaponneering to be delegated to the unit level (particularly for “standard” targets where many solutions would suffice) under the guidance of “best

²⁵ Ibid., 12.

²⁶ Ibid., 12.

available ordnance”. In this case, weaponeering guidance must be clearly articulated to subordinate units to ensure compliance with targeting constraints and restraints.

Force Application

Force application is the process of optimizing delivery platforms and weapons to prosecute targets on the prioritized target list.²⁷ In essence, force application is a search for the right “tool” to accomplish the objective and, therefore, should keep vested community interests at arms-length. Force application makes tradeoffs between limited resources and should account for all joint force capabilities, not simply those residing within the air component. Consequently, targets may not necessarily be struck in the prioritized order they appear, but rather, in a sequence that takes into account weather, target vulnerabilities, and threats. In other words, force application blends the science of prioritizing targets with the art of campaign planning—it is where the science and art of war coalesce.

When a specific delivery platform has been matched to a weapon and assigned a target, support assets are added and the size and composition of the force is determined.²⁸ The intent is to group various missions together to optimize the use of support assets and to exploit various capabilities resident in a complete strike package. This planning may help identify key shortfalls in required resources and provide justification additional forces. By accounting for the entire resource demands and flow plan of the targets, force application can also provide insight into the timelines required to complete the campaign’s phases. In this way, force application helps facilitate long-range planning efforts.²⁹

²⁷ Delivery platform is used here and throughout this study to denote the resource assigned to engage a target. In this sense, delivery platform is a generic term that represents any land, sea, air, space, or special operations asset as well as any applicable Information Operation asset.

²⁸ Joint Targeting School, “Joint Targeting Definition and Process,” briefing slides, 14 January 1999.

²⁹ Ibid.

Execution Planning / Execution

This step is comprised of detailed planning at the component and unit level and execution of the assigned mission. Component staffs take force application products and publish air tasking orders (ATOs), operations orders (OPORDs), or fragos (fragmentary forms of OPORDs) that task subordinate units to plan and execute the mission. Essential planning materials that accompany subordinate orders include desired mean point of impact (DMPI), weapons and fusing, time-on-target, routings, command and control information, and combat assessment tasking.³⁰

During execution, the joint targeting cycle remains responsive to current operations. Targeting priorities established in target development form the basis for responding to emerging time-sensitive-targets. Expedient solutions can be developed and relayed to component commanders who can either divert assets, task alert assets, or conduct deliberate planning for follow-on missions depending on the priority.

Combat Assessment

The intent of this final step is to translate execution results into meaningful information, allowing the commander to appraise the war effort with some degree of confidence. In particular, combat assessment collects and interprets targeting results, helps formulate subsequent battle plans, collects valuable empirical data on weapon and weapon system performance, and serves as a benchmark for validating whether targeting results accomplished the objectives.³¹ Because of the high demand and low density of collection assets, it is vital that their employment corresponds to the prioritized target list. To fulfill its intended purpose, combat assessment should incorporate five considerations: 1) objective of the attack, 2) knowledge of weapon employed, 3) detailed understanding of the target (including pre-strike physical condition), 4) the aim-point, and 5) post-strike photo imagery.³² Neglecting any of these five essential ingredients can lead to a

³⁰ Ibid.

³¹ Joint Targeting School, *Student Guide*, 25 March 1997, 14.

³² Other collection products such as cockpit video, data-link video from airborne or ground-based sources, and mission reports can and do provide valuable insight into the combat assessment process.

superficial analysis of the target and perhaps cause an incorrect assessment of the damage.

Combat assessment is composed of three functions: battle damage assessment (BDA), munitions effect assessment (MEA), and reattack recommendations (RR). BDA consists of three distinct but related areas of analysis: physical damage assessment, functional damage assessment, and systemic assessment:

Physical damage assessment: (Phase I BDA). The intent of this analysis is to determine what effect the weapon had on the target's physical structure. Results are typically presented as a quantitative percentage (10 percent of the building sustained structural damage) but can be depicted in descriptive terms (light, moderate, or heavy damage).³³

Functional damage assessment: (Phase II BDA). This assessment combines the objective data from Phase I analysis with collection information from other sources (human intelligence—HUMINT, signals intelligence—SIGINT, electromagnetic intelligence—ELINT, and imagery intelligence—IMINT) to determine the functionality of the target.³⁴

Systemic assessment: (Phase III BDA). This assessment combines the functional damage assessment with knowledge of the enemy system in which the target resides. The intent is to determine to what extent did damaging the target degrade the enemy system as a whole. Although an exhaustive process, Phase III BDA will ultimately determine the extent to which the objective has been achieved.³⁵

While BDA is focused on evaluating present circumstances in war, MEA is concerned with providing performance feedback on munitions with the aim of improving future results. MEA evaluates the effectiveness and reliability of a weapon by investigating delivery parameters, fusing, target characteristics, and BDA.³⁶ MEA can be used to identify and correct weapons malfunctions in the short-term (i.e. during hostilities), as well as providing data for long-term projects (i.e. joint munitions effectiveness manuals—JMEMs).

³³ Hickey, IX-1

³⁴ Hickey, IX-1

³⁵ Hickey, IX-1

³⁶ Joint Targeting School, *Student Guide*, 25 March 1997, 14-16.

The final element of combat assessment is RR. BDA generally initiates RR by identifying those targets that have not met their desired damage criteria. Combat analysts consider tactics, penetration aids, enemy/friendly countermeasures, and reasons for initial failure prior to recommending a target for reattack.³⁷ Targets that are validated for reattack are reentered into the targeting cycle.

Scientific Problem Solving: An Intellectual Foundation

To this point, only the external features of the joint targeting cycle have been explored by this study: its definitions, core actors, components, and defining process. What has yet to be explained are the internal organs of the joint targeting cycle—its intellectual “guts.”

The sound reasoning behind the joint targeting cycle can be traced to the Committee of Operations Analysts (COA) during WWII. The COA, which eventually evolved into the Joint Target Group, was created to solve the US Army Air Corps’ inability to conduct comprehensive target analysis.³⁸ Although there were many targeting methodologies employed during WWII, it was not until the COA under Gen Henry H. “Hap” Arnold that targeting adapted a scientific approach.³⁹ In addition to air intelligence officers, COA combined a wealth of civilian expertise in economics, statistics, and other technical fields.⁴⁰ Through this civilian connection, targeting was exposed to logical problem-solving principles, which helped determine aim-point solutions for both Germany and Japan.⁴¹ General Haywood Hansell reflected in his memoirs on the value of this process:

³⁷ Joint Targeting School, *Student Guide*, 25 March 1997, 14-16.

³⁸ Glock, 20.

³⁹ Glock, 20.

⁴⁰ Alexander S. Cochran, et al., *Piercing the Fog*, ed. John F. Kreis, (Bolling Air Force Base, Washington, D.C.: Air Force History and Museums Program, 1996), 28, 152-153.

⁴¹ *Ibid.*, 153-154.

“I believe 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.”⁴²

Today, the joint targeting cycle profits from the logical methods used by these early targeting pioneers. Just as COA was established on sound problem-solving principles, so too is the joint targeting cycle girded on a similar foundation: a six-step scientific problem-solving methodology, which will provide the template for evaluating the case studies in the following chapters (see Table 1).

<u>Step</u>	<u>Targeting Cycle</u>	<u>Scientific Problem-solving</u>
1	Objectives and Guidance	Identify the problem
2	Target Development	Gather the necessary data
3	Weaponizing Assessment	Formulate possible solutions
4	Force Application	Compare the solutions
5	Execution planning/Execution	Implement the selected solution
6	Combat Assessment	Compare the predicted results of the implemented solution with the actual results

Summary

This chapter has presented a theoretical explanation of joint targeting—how the process is designed to work. Put into practice, however, the joint targeting cycle is routinely confronted with vast uncertainty and friction that distinguishes “real war from

⁴² Hansell S. Haywood, *The Air Plan that Defeated Hitler*, (Higgins-McArthur/Longino & Porter, Inc., Atlanta, GA, 1972), 10.

⁴³ Lt Col Paul T. Dolson, “Warfighting Solutions: Finding the Answers,” briefing slides, US Atlantic Command J-35, 18 December.

war on paper.”⁴⁴ Less than perfect intelligence, severe time constraints, and communication problems are among the characteristics of “real war” that impede the practitioner’s ability to reach appropriate targeting solutions. To serve the military commander’s requirements in “real war”, the joint targeting process is often adapted to the context and nature of the circumstances. For this reason, the joint targeting cycle does not typically appear as the single, coherent, and self-contained targeting methodology found in joint manuals. As the following case studies will reveal, joint targeting is a complex military discipline that is influenced by a range of political and military factors. It is in this interaction with the contextual environment that recurring deficiencies in the joint targeting process tend to exist.

⁴⁴ Carl von Clausewitz, *On War*, trans. and ed . Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 119

CHAPTER 3

JOINT TARGETING IN MAJOR THEATER WAR: A MIRAGE IN THE DESERT

When you are winning a war, almost everything can be claimed to be right and wise.

—Winston Churchill

At 0130 hours on 2 August 1990, lead elements of Iraq's Republican Guard burst across the Kuwaiti border enroute to a hostile takeover of the tiny Middle Eastern country. Within hours of the invasion, Kuwaiti armed forces were overrun, government officials had fled to Saudi Arabia, and the capital had fallen into enemy hands. One week later, Baghdad declared Kuwait the 19th province of Iraq. For the next six months, Iraq secured the spoils of its conquest as a US-lead coalition prepared to reclaim Kuwait by amassing a sizeable arsenal of combat power and fine-tuning a sophisticated military plan called Operation DESERT STORM.

Military archives are replete with the celebrated exploits of DESERT STORM: the stunning victory, the remarkable performance of airpower, the overwhelming land counter-offensive, and the spirit of "jointness." Highlighted by the impressive operational tempo and extraordinarily low US casualties figures, it is easy to understand why DESERT STORM is considered by many to be a model military campaign. Yet, as Eliot Cohen warned in the wake of DESERT STORM, "the greatest test of our strategic maturity will be our willingness to view critically our performance in this rout. Victory has a way of excusing a multitude of sins."⁴⁵

⁴⁵ Eliot A. Cohen, "After the Battle," *New Republic*, April 1, 1991.

Joint Targeting: Operation Desert Storm

DESERT STORM witnessed one of the largest targeting efforts in the history of warfare. In the first 24 hours alone, Coalition forces attacked more discrete targets than the cumulative efforts of Eighth Air Force in 1942 and 1943.⁴⁶ Although many groups contributed to the joint targeting process during the campaign⁴⁷, primary responsibility for this enormous effort can be traced to two distinct organizations: US Central Air Force's (CENTAF) Tactical Air Control Center (TACC) and the Special Planning Group (later dubbed the "Black Hole"). As CENTAF's official command and control node for theater air operations, the TACC provided centralized planning for all air-to-surface missions in accordance with the prevailing agreements between the US Air Force and the US Army.⁴⁸ In this regard, the TACC's primary targeting forte consisted of destroying tactical-level targets in support of surface forces. The Black Hole, in contrast, was an informal planning group tasked to develop a strategic air campaign against Iraq. The

⁴⁶ Lt Col David A. Deptula, "Firing for Effect: Change in the Nature of Warfare," *Defense and Airpower Series* (Aerospace Education Foundation, Arlington, VA, 1995), 1. Between 17 August 1942 (the 8th AF's first heavy bomber raid) and 31 December 1943, the 8th AF attacked 124 distinct targets while the number of DESERT STORM targets attacked during the first day of the war numbered more than 150.

⁴⁷ Eliot A Cohen, et al., *Gulf War Air Power Survey*, vol. 1, Planning and Command and Control (Hereafter cited as GWAPS), (Washington D.C. GPO: 1993), 170, 203. Naval Forces European Command (NAVEUR) initiated their own targeting and campaign planning aboard the USS *Saratoga*, on 14 August, 1990, aimed at reducing infrastructure in northern and central Iraq (electricity and communications). In addition, CENTCOM initiated a joint targeting process and published a "master target list" in September 1990. Initially Naval Forces Central Command (NAVCENT) demanded "direct approval" of all target tasking for naval assets in accordance with their philosophy of autonomous operations. Later, however, NAVCENT provided a small liaison element to work directly with CENTAF once it was clear that airpower would be coordinated by a single component—CENTAF.

⁴⁸ Richard G. Davis, *The 31 Initiatives* (Washington, D.C.: Office of Air Force History, 1987), 35. "On April 21, 1983, General Charles A. Gabriel, CSAF and General E.C. Meyer, CSA, signed a memorandum of understanding on 'Joint USA/USAF Efforts for Enhancement of Joint Employment of the AirLand Battle Doctrine.' In Army FM 100-5, 'Operations,' 20 August 1982." See also General Robert D. Russ, USAF (Commander of TAC), "Open letter to the Field," AirLand Bulletin 81-1 (Langley AFB, Va.: TAC-TRADOC ALFA, 31 March 1988), 7. According to General Russ, "Tactical aviators have two primary jobs—to provide air defense for the North American continent and support the Army in achieving its battlefield objectives."

Black Hole's targeting strategy centered on elements of the enemy's national power and represented a radical departure from the conventional wisdom of supporting the US Army on the battlefield. Although on paper the TACC and Black Hole shared the same command structure headed by Lt Gen Charles "Chuck" Horner, in practice their targeting efforts were far from unified.

In July 1990, US Central Command (CENTCOM) sponsored Internal Look 90 (IL-90), a joint command post exercise designed to reorient OPLAN 1002-90 from a Soviet invasion of Iran towards an Iraqi threat in the Middle East.⁴⁹ During IL-90, CENTCOM compiled a joint target list for OPLAN 1002-90 while CENTAF planners created their own target list called the *Iraqi Target Study*.⁵⁰ When General Horner tasked the TACC on 4 August to begin work on a sustained air campaign to defend Saudi Arabia, CENTAF planners merged these two target lists into a master list. The focus of TACC war planning became the selection of Iraqi targets from this master list for a defensive "D-Day Air Tasking Order (ATO)" and a one-day "Punishment ATO."⁵¹ To augment targeting efforts, CENTAF established a thinly manned Joint Target Coordination Board (JTCCB) to collate target nominations from newly arriving Marine Forces Central Command (MARCENT) and Army Forces Central Command (ARCENT), validate and prioritize their requests, and assign weapons to the resulting targets.⁵² To encourage further joint integration in the targeting process, the TACC made liberal use of liaison officers from the other components.⁵³

Concurrent with the defensive planning efforts of the TACC, a handful of mostly Air Force planners in the Black Hole began formulating an offensive plan designed to

⁴⁹ GWAPS, vol. 1, pt. 1: 25-28. OPLAN 1002-90 was designed as a defensive operation in support of Saudi Arabia. It was comprised of three phases: Deterrence, Defense, and Limited Counter-offensive. The Counter-offensive was designed to restore the Iraqi-Saudi Arabian border only—no mention was made of purely offensive operations or unilateral operations against Iraq.

⁵⁰ Thomas A. Keaney and Eliot A. Cohen, *Revolution in Warfare? Air Power in the Persian Gulf*, (Naval Institute Press, Annapolis, MD, 1995), 26. See also Maj John R. Glock, "The Evolution of Air Force Targeting," *Airpower Journal*, vol. VIII, no. 3 (Fall 1994): 24.

⁵¹ GWAPS, vol. 1, pt. 2: 171.

⁵² *Ibid.*

“win the war, through airpower alone.”⁵⁴ Under the direct supervision of Brig Gen “Buster” Glosson, this ad-hoc targeting group, which was an outgrowth of a planning effort initiated inside the Pentagon by the Air Staff’s “Checkmate” division, was largely removed from any “joint” oversight of its activities.⁵⁵ Just days after Iraq annexed Kuwait, Checkmate planners drafted an offensive plan called INSTANT THUNDER, which included 84 targets.⁵⁶ Although praised both in Washington and at CENTCOM Headquarters in Tampa, the Checkmate plan met with some resistance in Riyadh from General Horner. Nevertheless, the Checkmate planners who subsequently joined the Black Hole used INSTANT THUNDER as the conceptual blueprint for their targeting efforts.⁵⁷ Because offensive planning was clearly inconsistent with the initial defensive posture of National policy, the Black Hole became shrouded in secrecy. This high-level security shield effectively eliminated joint oversight of the Black Hole’s targeting efforts and led to significant coordination problems with the TACC. Almost immediately, a notable rift emerged between the TACC and the Black Hole that plagued CENTAF targeting efforts throughout the war.

Probably the most disputed issue between the TACC and the Black Hole concerned intelligence support for targeting.⁵⁸ The extensive intelligence support required to conduct strategic targeting was not readily apparent to CENTAF intelligence officers (CENTAF/IN). CENTAF trained and equipped its personnel to support Air-Land Battle doctrine and geared its targeting apparatus towards fielded forces rather than

⁵³ Ibid., 74. General Horner preferred to use joint liaison planners rather than place these officers on his staff.

⁵⁴ Ibid., 165.

⁵⁵ Ibid., 171.

⁵⁶ GWAPS, vol. 1, pt. 1: 146. These targets were designed to convince Iraqi leadership into withdrawing their troops from Kuwait. The target sets were offensive in that they targeted the Iraqi regime directly. The target sets included: Strategic Air Defenses, Chemical, Nuclear, Biological weapons, Scuds, Leadership, Command and Control, Electricity, Oil, and military support infrastructure.

⁵⁷ Lt Col David A. Deptula, transcript of interview with Tsgt Theodore J. Turner, 1 Nov. 1990, AFHRA #TF5-5-123 V. 34. p. 6.

⁵⁸ Kearney, 112-113.

leadership and national infrastructure.⁵⁹ CENTAF/IN did not deploy with the appropriate targeting materials to support a strategic air campaign, nor was it prepared to collect, study, assimilate, and manufacture strategic targeting products with the urgency required by the Black Hole.⁶⁰ Finding the TACC an inadequate source of intelligence, Black Hole planners turned to informal channels to obtain useful targeting information and analysis. General Glosson secured a close working relationship with Rear Adm Michael McConnell, the new Joint Chiefs of Staff (JCS) J-2, who provided everything from aim-points and BDA to national policy insight.⁶¹ The Black Hole exploited other informal channels through personal contacts in Checkmate, which proved to be extremely responsive. As a result, the Black Hole became almost totally dependent on its Washington-based intelligence lifeline and would often gain access to information days before the TACC, which was relying on the theater-based intelligence apparatus.

One month prior to DESERT STORM, General Horner reorganized the CENTAF targeting architecture by folding the Black Hole into the TACC “to strengthen and standardize our organizational alignment.”⁶² This signaled the shift in CENTAF orientation from a defensive posture aimed at retaining Saudi Arabian territory to an offensive posture designed to retake Kuwait. General Horner divided his Guidance, Apportionment, and Targeting (GAT) division (the TACC’s targeting “soul”) into an Iraqi Planning Cell and a Kuwait Theater of Operations (KTO) Cell. This move officially established targeting responsibilities within CENTAF. The Black Hole assumed control of the Iraqi Planning Cell and focused on strategic targeting in Iraq and

⁵⁹ Deptula interview 1 Nov 1990, 6. Lt Col Deptula noted that the CENTAF’s CAFMS (Computer Aided Force Management System), the computer system used to help plan the Air Tasking Order, only recognized interdiction, counter-air, and close air support. Although a recognized Air Force mission, strategic attack was not included in the software, reflecting the focus on Air-Land Battle doctrine.

⁶⁰ GWAPS, vol. 1, pt. 2: 172.

⁶¹ Ibid., 180-181; Maj John R. Glock, JCS/J2-T, Pentagon, Washington D.C., transcript of interview with author, 15 Jan 1999. Maj Glock was the only targeting officer in the Black Hole throughout the war.

⁶² GWAPS, vol. 1, pt. 1:185.

the KTO, while the TACC was assigned the KTO Planning Cell and would focus on tactical-level targeting of the enemy's fielded force.⁶³

The final element of CENTAF's targeting architecture came together as the war got underway with the inclusion of Joint Task Force Proven Force (JTF-PF). In December 1990, JTF-PF was established at Incirlik Air Base, Turkey to open a northern front with Iraq in hopes of diverting its attention and assets away from the KTO. JTF-PF provided a very valuable capability in areas that CENTAF aircraft had trouble reaching. CENTAF assigned a master target list to JTF-PF, but allowed its planners the autonomy to plan and execute the missions as they saw fit. Though JTF-PF proved to be very effective in the air campaign, its performance suffered at times from a lack of precision guided munitions (PGM) capability.⁶⁴

Soon after the start of hostilities, an internal dispute developed between CENTCOM's land component and air component regarding KTO targeting. MARCENT and ARCENT claimed that CENTAF was allocating the bulk of its targeting resources on Iraq at the expense of the KTO, where the impending ground battle was to take place. On 9 February, 1991, General Schwartzkof, Commander-in-Chief of US Central Command (CINCCENT), took action to defuse the heated exchanges by appointing his deputy, Lt Gen Calvin Waller, to head the JTCCB. Although this action helped ensure that land component target nominations received higher priority at the JTCCB, it did not alter the overall configuration of CENTAF's joint targeting process (see Figure 4).⁶⁵

⁶³ GWAPS, vol. 1, pt. 2: 187.

⁶⁴ GWAPS, vol. 1, pt. 1: 235.

⁶⁵ Eliot A Cohen, et al., *Gulf War Air Power Survey, Summary*, (Washington D.C. GPO: 1993), 154-155.

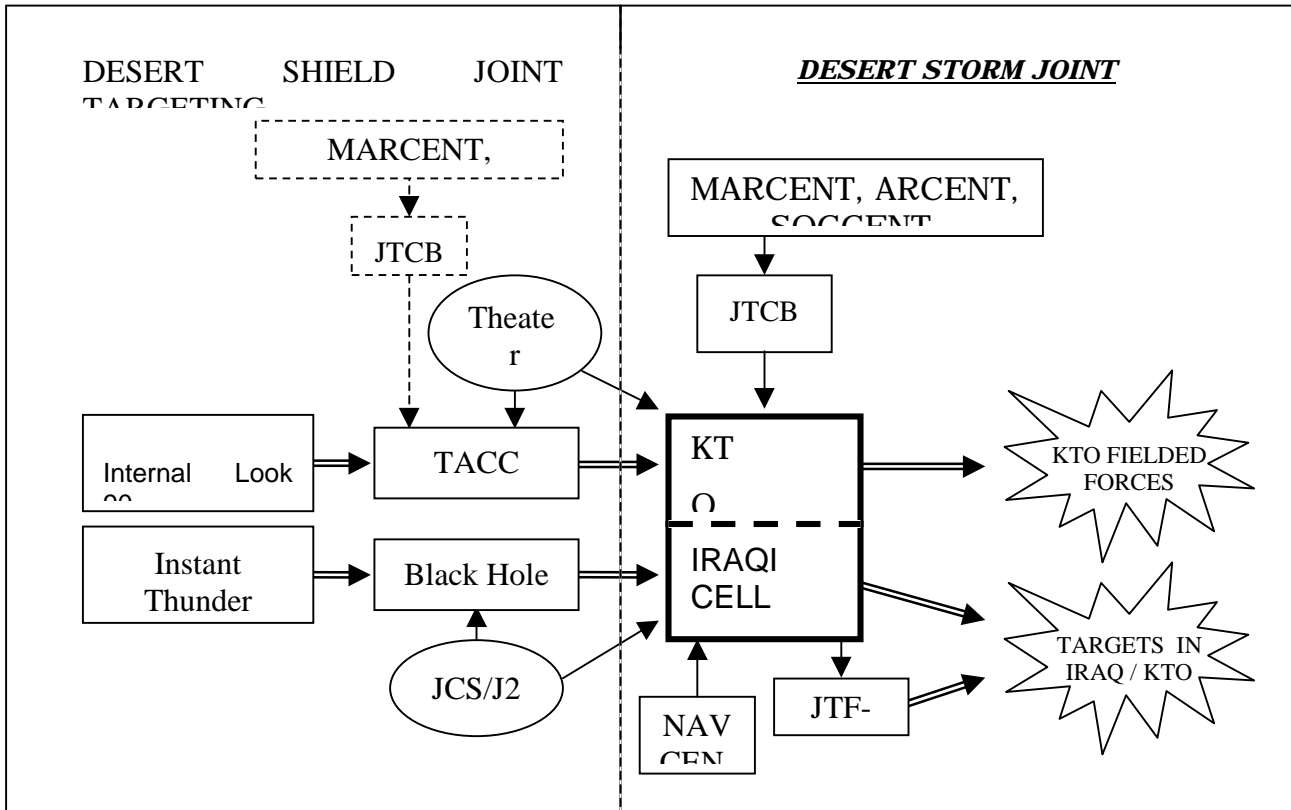


Figure 4. Overview of Joint Targeting during the Gulf War

What did joint targeting accomplish?

By anyone’s definition, the volume and speed of the joint targeting effort in DESERT STORM was impressive. Though it is impossible to quantify the targeting results with any certainty, a qualitative overview does provide some insight into the merits of the joint targeting process. Consider, for instance, the joint targeting efforts to gain air superiority, which started in earnest during the initial strike on Day 1. Ten days into the battle, CINCCENT, based on the judgement of his air component, declared that the Coalition had achieved air supremacy over the battlespace.⁶⁶ Air strikes planned by the joint targeting system were particularly effective in neutralizing the Iraqi integrated

⁶⁶ GWAPS, vol. 2, pt. 2: 158. By General Schwarzkopf’s criteria, this meant that the Iraqi Air Force was no longer a capable fighting force.

air defense system (IADS), allowing only 38 aircraft losses in 69,103 combat sorties.⁶⁷ The joint targeting process was also able to achieve a considerable strategic effect on the Iraqi war machine. For example, Coalition air strikes either damaged or destroyed almost 70 percent of the Iraqi military communications system while the national telecommunication system was reduced by almost 40 percent of its operational capacity. Additionally, over 60 percent of the known leadership targets were either damaged or destroyed during the operation. Though the joint targeting process did not achieve complete isolation of the Iraqi leadership, this level of destruction did cause significant disruptions and dislocations for the Iraqi regime.⁶⁸

Coalition airstrikes planned by the joint targeting process also created important effects in the KTO. Route capacity for the lines of communication (LOCs) stretching from Baghdad to the KTO were reduced from over 200,000 metric tons per day to about 20,000 metric tons per day.⁶⁹ Of the 55 highway and railroad bridges supporting the route from Baghdad to the KTO, 48 were rendered unusable by the end of the war.⁷⁰ An additional 31 temporary bridges were also damaged or destroyed, which further contributed

⁶⁷ Ibid., 116. This equated to one aircraft loss for every 1,819 sorties. To put this number in perspective, the loss rate in Vietnam varied from one aircraft per 383 sorties in Rolling Thunder to one aircraft loss for every 128 sorties in Linebacker II.

⁶⁸ Ibid., 288-290. Without access to Iraqi leadership, the true extent to which the targeting effort degraded leadership will remain a mystery. However, external indications noted by the GWAPS writes shed some light on the subject. According to GWAPS, "Common sense, of course, would argue that the nearly 850 strikes carried out against L [leadership] and CCC [command, control, communications] targets must surely have inflicted significant disruption and dislocation of the Iraqi government. Of the 480 strikes involving precision-guided munitions, most were conducted by F-117s. Accurately hitting government ministries, command and control facilities, headquarters, and communications centers with 2,000-pound laser guided bombs must surely have had considerable impact. Beyond the visceral fear of being killed or maimed that individuals of Saddam Hussein's government were forced to relocate and shift to back-up communications. For example, key elements of the Iraqi regime are thought to have relocated one or more times during the war, and some of their personnel are believed to have been killed by air attacks. And immediately after the war, not only did rebellions against Ba'thist rule break out among the Kurds in the north and Shiite Muslims in the south but Western reporters observed that, for the first time in years, ordinary Iraqi citizens were willing to criticize Saddam Hussein openly."

⁶⁹ Ibid., 195.

⁷⁰ Ibid., 182.

to the targeting effect.⁷¹ The significant reduction in resupply capacity for the fielded forces in the KTO led to wide spread shortages of food and water and caused a serious decay in morale for the Iraqi Army.⁷²

Despite the long list of achievements in DESERT STORM, the joint targeting process had several deficiencies. Probably the most notorious targeting miscalculation of the war came on 13 February with the bombing of the Al Firdos bunker. Though known to be an Iraqi military command post, target analysis failed to uncover that the bunker also served as an air raid shelter for hundreds of Iraqi civilians. Following an attack on the bunker that killed approximately 200-300 non-combatants, policy-makers in Washington curtailed targeting efforts in Baghdad for the remainder of the war.⁷³ Whether or not this collateral damage could have been avoided is still a matter of debate. Nonetheless, this incident highlights in dramatic fashion that deficiencies in the joint targeting process were both real and detrimental to the conduct of DESERT STORM.

Joint Targeting Deficiencies

The joint targeting process encountered four major deviations from the scientific problem-solving methodology that adversely affected its contribution in DESERT STORM.

Issue #1: DEFINING THE PROBLEM: *The joint targeting process did not fully adhere to the policy restraints of DESERT STORM.*⁷⁴

For the most part, senior military officers involved in the planning and execution of DESERT STORM did a remarkable job translating political desires into military

⁷¹ Ibid., 186.

⁷² Ibid., 202. The Iraqi's poor intra-theater distribution system also contributed to the poor overall support its regular army troops received in the field.

⁷³ Ibid., 283.

⁷⁴ Political objectives, military objectives, constraints, and restraints are the essential parameters that frame a crisis situation. This information is used to "define the problem" and to help formulate an adequate end-state. If these parameters are not understood and adhered to, the joint targeting process is likely to pursue actions that either do not support the objectives, violate stated guidance (constraints/restraints), or both.

actions. Despite their efforts, however, some unfortunate consequences resulted from the targeting of Iraqi infrastructure that were not in full compliance with the following two policy restraints: (1) casualties among Iraqi noncombatants would be held to a minimum, and (2) damage to the Iraqi economy and its capacity for postwar recovery would be limited.⁷⁵ These restraints emerged from repeated statements by President Bush declaring “the United States has no quarrel with the Iraqi people”⁷⁶ and also appeared in the President’s war directive for DESERT STORM.⁷⁷ In general, the CENTAF planning staff was familiar with these restraints, but unit level planners were much less informed regarding the policy guidance.⁷⁸

Two examples help to illustrate how joint targeting infringed upon the policy restraints: (1) targeting the Iraqi electrical power grid, and (2) targeting Iraqi petroleum, oil, and lubricants (POL). The objectives for targeting electrical power were multifaceted. Politically, the Iraqi Planning Cell acknowledged that it was seeking long-term “leverage” against the Iraqi people; militarily, power grid attacks were designed to affect telecommunications indirectly, impose psychological pressure on the Iraqi people, and degrade the IADS by forcing equipment onto less reliable power sources.⁷⁹ CENTAF determined that targeting boilers and generator halls would cause undesirable (long-term) harm to the Iraqi power grid and should be avoided. Instead, CENTAF planners endorsed targeting transformers and switching yards, which yielded the same effect but resulted in a much shorter recuperation period.⁸⁰ In a targeting policy memo distributed to subordinate units, General Glosson articulated this guidance to avoid needless damage to Iraq’s infrastructure.⁸¹

⁷⁵ GWAPS, vol. 1, pt. 1: 90.

⁷⁶ Ibid., 91.

⁷⁷ Ibid., 91.

⁷⁸ Eliot A. Cohen, et al., *Gulf War Air Power Survey*, vol. 2, Operations and Effects and Effectiveness, (Washington, D.C.: GPO, 1993), pt 1: 293.

⁷⁹ GWAPS, vol. 1, pt. 1:116.

⁸⁰ GWAPS, vol. 2, pt. 2: 306.

⁸¹ Ibid. Cal Hickey, US Atlantic Command, Norfolk, VA, interview with author, 14 January, 1999. According to Mr. Hickey, there is conflicting evidence when this targeting memo was actually published for the subordinate units. During DESERT STORM, Mr. Hickey was a planner at the Cruise Missile Support Activity directly

From a military standpoint, targeting Iraqi electrical power proved to be very successful. By the end of the conflict, 88 percent of the Iraqi electrical system had been shut down, which effectively achieved the desired influence on the Iraqi telecommunications and IADS systems. There were, however, unintended consequences that accompanied this level of devastation. First, long-term damage inflicted on the Iraqi power grid was widespread. For example, a post war survey of fourteen major electrical power plants in Iraq revealed that eleven (79 percent) had received damage to their boilers and generator halls.⁸² Second the lack of electricity effectively shutoff water pumping and purification systems in Iraq, causing widespread shortages of potable water.⁸³ Last, power grid damage caused electrically powered sewage treatment to shutdown, which caused a significant increase in cases of gastroenteritis, cholera, and typhoid in Iraqi noncombatants.⁸⁴

Regarding the political “leverage” CENTAF planners were seeking, there is no evidence to suggest targeting the power grid achieved this result.⁸⁵ Although the psychological pressure of removing electricity from modern life was expected to encourage a change in government, the only tangible post-war result was a marked increase in the death rate of the Iraqi populace.⁸⁶ The Iraqi people either ignored or did not understand the intended psychological message of “turning off the lights in Baghdad.”⁸⁷ Supplemental efforts to communicate the “message” to the Iraqi people

supporting NAVCENT cruise missile employment and does not remember ever seeing this memo. Moreover,

⁸² Ibid.

⁸³ GWAPS, vol. 2, pt. 2: 305-307.

⁸⁴ Kearney, 64. May 1991 Harvard Study Team report. Estimates of between 70,000 and 90,000 deaths above the normal mortality rate were predicted by Greenpeace International. In all, William M Arkin, a member of Greenpeace international, estimated the final death toll of “indirect detrimental health effects” to be 110,000. Mr. Arkin based much of his estimates on personal trips to Iraq following the Gulf War. These estimates, however, did not account for the rapid resumption of electrical power that the Iraqis were able to accomplish less than a year after the war.

⁸⁵ GWAPS, vol. 2, pt. 2: 304.

⁸⁶ Ibid., 292.

⁸⁷ Ibid., 292.

more directly using psychological operations (leaflet drops) were disapproved by CINCCENT, further diluting post-war “leverage” potential.⁸⁸

There appear to be two fundamental reasons why the Iraqi infrastructure suffered serious systemic damage. First, the Iraqi Planning Cell targeting did not fully anticipate the widespread secondary effects on Iraqi civilians that would be caused by the power grid attacks. CENTAF planners viewed attacks on electrical power in military terms: the indirect effects on telecommunications and the Iraqi IADS. They sought to comply with restraints by selecting transformers and switching yards as aim-points while employing precision guided munitions (PGMs) to limit noncombatant fatalities. With these perceptions in place, there was nothing to preclude targeting efforts from seeking maximum effect on the Iraqi power grid—more damage was better. The Hartha power plant in Basra, for example, was designated a “dump” target for US Navy and US Marine Corps aircraft and sustained no less than a dozen attacks during the war.⁸⁹ Following the war, intelligence analysts suggested:

“...that simultaneously hitting as few as three major power plants would have been enough to force Iraq’s power grid to shut down. Most national or regional electric power grids can only handle the loss of two major facilities without having to shut down to avoid system-wide damage, as the 1965 blackout of the northeast US demonstrated.”⁹⁰

Though this evidence may appear somewhat retrospective, it does illustrate the non-traditional, yet very useful information available to the targeting process. Clearly, the power grid targeting led to a quantitative level of power grid damage that exceeded military requirements and needlessly worsened the plight of post-war non-combatants.

⁸⁸ GWAPS, vol. 2, pt. 1: 246.

⁸⁹ GWAPS, vol. 2, pt. 2: 298; William M. Arkin, “Airpower in four limited wars: Observations from the ground,” notes from briefing given to School of Advanced Airpower Studies, 8 April 1999. Mr. Arkin refutes the GWAPS claim and insists that repeated F-15E attacks on this power plant were to blame and that the US Navy and Marine Corps dump targets were some six miles away from this particular site.

⁹⁰ GWAPS, vol. 2, pt. 2: 294, 307.

A second source of unintended power grid destruction stems from the decision to delegate aim-point selection to subordinate units. Although the Iraqi Planning Cell was the authority on power grid target selection, it would often allow combat units to select the actual aim-points.⁹¹ Unit level planners, however, were accustomed to seeking maximum damage against targets and boilers and generator halls offered the most lucrative aim-points.⁹² Cruise missile planners supporting NAVCENT, in particular, programmed a number of their Tomahawk Land Attack Missiles (TLAMs) to attack generator halls for this very reason.⁹³ Although General Glosson reportedly published his targeting memo prior to hostilities, many units did not receive the guidance until early February 1991. Unfortunately, by that time most power plant attacks had already caused wide-spread damage to boilers and generator halls.⁹⁴ As a result, a significant level of qualitative long-term damage was inflicted upon the Iraqi electrical power system.

Attacks on Iraqi POL production provide a second example of infrastructure damage that failed to comply adequately with planning restraints. CENTAF's objectives for POL targeting were (1) prevent any further flow of fuels to the Iraqi armed forces, and (2) prevent further Iraqi aggression.⁹⁵ A secondary benefit of POL attacks was a reduction in available fuel for use in back-up generators that were powering many segments of the Iraqi military.⁹⁶ To do this, the Iraqi Planning Cell sought to reduce the refined POL available for consumption by 70 percent.⁹⁷ In accordance with planning restraints, CENTAF decided that attacks on POL would favor refined-product storage and

⁹¹ GWAPS, vol. 2, pt. 2: 294. Footnote 60 provides this insight.

⁹² GWAPS, vol. 1, pt. 1: 117. Planners often referred to the "Critical elements of selected generic installations handbook" to derive aim-points. Refer to government document ddb-2800-2-83 CHG. 8 (Aug 94) for additional information on this secret publication.

⁹³ Calvin W. Hickey, United States Atlantic Command, Norfolk, VA, interview with author, 14 Jan. 1999. Cal Hickey is the senior civilian targeteer at US Atlantic Command. He has been in the business of targeting for the past 29 years and help found the first US Air Force targeting school and had extensive experience in DESERT STORM targeting.

⁹⁴ GWAPS, vol. 2, pt. 2: 293, 297.

⁹⁵ GWAPS, vol. 1, pt. 1: 163-4.

⁹⁶ GWAPS, vol. 2, pt. 2: 293.

⁹⁷ GWAPS, vol. 1, pt. 1:, 116

refining capability while avoiding long-term damage to distillation (cracking) towers unless the plant was known to produce military fuels.⁹⁸

Targeting results against POL were mixed. The targeting effort caused a refinery capacity reduction of 93 percent and a decrease in refined-product storage by 20 percent.⁹⁹ There were, however, some refineries that received long-term damage to their cracking towers, both deliberately and accidentally. Distillation towers at Al Basra, Bayji, and Dawrah, which represented 90 percent of Iraq's refining capacity, all sustained intentional damage from either TLAMs or F-117 aircraft.¹⁰⁰ Unintentional damage was also inflicted on the Bayji refinery by JTF-PF assets, which resulted in a warning from CENTAF to "knock it off."¹⁰¹

In general, long-term damage to POL that appears to have violated policy restraints came from two sources. First, CENTAF rationalized distillation tower attacks on Al Basra, Bayji, and Dawrah by declaring their long-term shutdown a military necessity. Uncertainty over the timing and duration of the ground counter-offensive (especially early in the air campaign when two of the three were struck) drove planners to seek a more permanent solution to ensure these refineries did not contribute to the war effort. However, CENTAF/IN had confirmed that the Iraqi Army and Republican Guard had access to organic POL supplies capable of sustaining combat operations for weeks, if not months.¹⁰² In addition, CENTAF knew that Iraqi forces in the KTO were operating Kuwaiti refineries and also had access to Kuwait POL stocks.¹⁰³ Considering this level of cushion and depth within Iraq's POL system one must ask: was POL even a viable target in this case? Although the answer is debatable, it does call into question the military utility of inflicting long-term damage to 90 percent of Iraq's oil refining capacity.

⁹⁸ GWAPS, vol. 2, pt. 2: 293.

⁹⁹ Kearney, 102.

¹⁰⁰ GWAPS, vol. 2, pt. 2: 299, 295.

¹⁰¹ GWAPS, vol. 2, pt. 1: 238.

¹⁰² GWAPS, vol. 2, pt. 2: 311. Iraqi ground forces were static during the air campaign, which allowed them to conserve their POL reserves until absolutely required to repel the Coalition ground counter-offensive.

¹⁰³ *Ibid.*, 311.

The extensive use of non-precision weapons also contributed to the long-term damage inflicted on the Iraqi POL system. CENTAF planners reasoned that the sprawling nature of POL targets did not necessitate wasting PGMs when less costly non-precision weapons would suffice. But the massive Bayji refinery raid by JTF-PF, whose aircraft dropped nearly a hundred 2,000-pound bombs, inflicted significant damage to two cracking towers because their attacks employed non-precision weapons.¹⁰⁴ Other refineries, including the As Samawah petroleum factory, also sustained cracking tower damage for similar reasons.¹⁰⁵ Although unintentional, the long-term damage to these refineries due to the use of non-precision munitions does not appear to fit comfortably with the policy restraints.

Issue #2: *GATHERING SUFFICIENT DATA:* *The joint targeting process failed to obtain information that was critical to achieving the political and military objectives of DESERT STORM.*

Considering they started from nearly a “cold start” in DESERT SHIELD, the US intelligence community made a remarkable contribution in DESERT STORM. General Schwarzkopf, in testimony before Congress, stated: “We had very, very good intelligence support. We had terrific people.”¹⁰⁶ Due to their efforts, the Automated Intelligence-Information File, which track all Iraqi installations of interest, grew from 2,239 on 2 August, 1990, to almost 3,200 by the start of DESERT STORM—a 43 percent increase in under six months.¹⁰⁷ The Iraqi Planning Cell’s target list swelled from 84 targets in August to over 770 by the end of the war, chiefly due to the hard work of the intelligence community.¹⁰⁸ In spite of these efforts, intelligence sources were unable to uncover more

¹⁰⁴ Ibid., 238.

¹⁰⁵ Ibid., 294.

¹⁰⁶ GWAPS, vol. 1, pt. 2: 265.

¹⁰⁷ GWAPS, vol. 1, pt. 1: 219. This list of known Iraqi targets was essentially a target repository that supported the targeting efforts of the Iraqi Planning Cell and KTO Planning Cell. These targets were in the categories: Airfields, NBC-associated, C3, Electrical, Military Leadership, Oil, Naval, Railroads and Bridges, Strategic Air Defenses, Scud associated, and Tactical Air Defenses.

¹⁰⁸ Keaney, 116.

than a few aim-points in two critical Iraqi military capabilities: (1) the Iraqi nuclear program, and (2) the Scud threat.

Early in DESERT SHIELD, CENTCOM identified the Iraqi nuclear program as one of three enemy “centers of gravity” (COGs).¹⁰⁹ The USCINCCENT OPLAN for DESERT STORM stipulated that Iraqi COGs “will be targeted throughout...to ensure destruction, neutralization, elimination, or degradation as soon as possible.”¹¹⁰ Before the war, President Bush also expressed his intentions regarding Iraq’s nuclear program: “We are determined to knock out Saddam Hussein’s nuclear bomb potential.”¹¹¹ From the outset, however, Iraq’s chemical weapons threat garnered most of the attention because of Iraq’s demonstrated willingness to use its impressive stockpiles. Further, intelligence reports estimated that Iraq’s nuclear program was still 8 to 24 months from fielding a nuclear weapon.¹¹² Only one nuclear facility (Al Tuwaitha) had been identified by August 1990, and intelligence sources managed to uncover just one additional nuclear related target by January, 1991 (a uranium-ore mine northwest of Baghdad).¹¹³ These two targets represented the extent of US knowledge on the Iraqi nuclear threat at the start of DESERT STORM.

Near the end of hostilities, US intelligence was only beginning to comprehend the true magnitude of the Iraqi nuclear program. The Iraqi Planning Cell formulated a 72-hour ATO designed as a last ditch effort to destroy newly discovered Iraqi nuclear sites. On this target list were seven additional nuclear facilities, including Al Atheer, which was later confirmed by UN weapons inspectors to be the designated production site for

¹⁰⁹ Carl von Clausewitz, *On War*, trans. and ed. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 596. Clausewitz coined the phrase “center-of-gravity” and described it as the ‘hub of all power...the point against which all our energies should be directed.’ From GWAPS, vol. 1, pt. 1: 2; The three centers of gravity for DESERT STORM were generally considered to be: (1) Leadership, command and control, (2) WMD (chemical, biological, and nuclear) capability and (3) forces of the Republican Guard.

¹¹⁰ GWAPS, vol. 1, pt. 1: 2.

¹¹¹ Jeffery Record, *Hollow Victory: A Contrary View of the Gulf War*, (Brassey’s (US), Inc., Washington D.C., 1993), 40.

¹¹² GWAPS, vol. 1, pt 1: 159.

¹¹³ GWAPS, vol. 2, pt. 2: 316.

Iraq's first nuclear weapon. F-117s attacked this site just days before the cessation of hostilities, but unknown to CENTAF/IN, this site was far more important than they realized.¹¹⁴ Had the Iraqi Planning Cell known the true value of Al Atheer to the Iraqi nuclear program, they would have ordered many additional strikes.¹¹⁵ As it turned out, most Iraqi nuclear facilities were on CENTAF's master target list, but intelligence was unable to reveal the true identity of these sites. Consequently, many nuclear sites were placed into lower priority categories (rocket propulsion site, missile production facility, etc.) and were never attacked. Post war investigations uncovered 21 nuclear related sites in Iraq, of which only about 30 percent had actually been attacked during the conflict.¹¹⁶

There are two reasons why US intelligence did not accurately assess the Iraqi nuclear program: the Israeli airstrike on Al Tuwaitha, and the cold war paradigm. Israel's highly successful air raid on Iraq's nuclear facility in 1981 demonstrated to Saddam Hussein the need for a covert nuclear program.¹¹⁷ By the end of 1981, Iraq had embarked on an aggressive nuclear program characterized by redundant capabilities, state-of-the-art concealment techniques, and advanced hardening of nuclear facilities. Booming oil revenues in the 1980s allowed Iraq to devote enormous resources to their nuclear program, which aided its swift and secret development. The fact that Iraq was [and remains] a totalitarian state further added to the successful cloaking of their nuclear program. As a result, US intelligence sources were reporting only 10 percent of Iraq's total nuclear program prior to DESERT STORM.

The second and more important reason that US intelligence failed to evaluate the Iraqi nuclear threat was the Cold War paradigm. For 50 years, the central focus of US intelligence operations was on the Soviet threat. All CENTCOM war plans previous to OPLAN 1002-90 were oriented towards USSR aggression in the Middle East and were

¹¹⁴ GWAPS, vol. 2, pt. 1: 226-227.

¹¹⁵ GWAPS, vol. 2, pt. 1: 226-227.

¹¹⁶ Ibid., 225. See also GWAPS, vol. 2, pt. 2: 316-317. Following the war, the International Atomic Energy Agency uncovered over twenty nuclear sites in Iraq, of which sixteen were described as "major facilities."

¹¹⁷ GWAPS, vol. 2, pt. 2: 314-315.

not focused specifically on collecting against regional countries—particularly Iraq.¹¹⁸ Despite the clandestine nature of Iraq’s nuclear program, there were signals that Iraq was aggressively seeking a nuclear device. Iraq’s appetite for nuclear reactors during the 1980s did not correspond to any legitimate electrical power shortfall in the country.¹¹⁹ Evidence also emerged that Iraq had acquired “massive” amounts of uranium concentrate from Brazil, Portugal, and Niger.¹²⁰ But these and other warning signs went unnoticed by the US intelligence community, who was far more concerned with monitoring the USSR. Consequently, the lack of focus on Iraq and its nuclear program by the intelligence community in the years prior to 1990 could not be fully rectified by the “full court press” that transpired in the few months leading up to DESERT STORM.

The Iraqi Scud threat is a second example of how the joint targeting process failed to gather and analyze information on a key target set. Two aspects of the Scud threat were uncertain: the number of mobile launchers and their employment strategy. US intelligence was able to locate Iraq’s fixed launch sites and infrastructure, but was unable to determine probable mobile launch locations.¹²¹ Defense Intelligence Agency (DIA) officials admitted after the war that there was “no accurate accounting of numbers of mobile launchers or where they were based [or] hiding.”¹²² Intelligence sources, for example, had estimated the number of mobile launchers in Iraq’s possession to be in the mid-twenties, but post-war evidence revealed as many as 36.¹²³

Even more puzzling than the number of mobile launchers was how Baghdad planned to use the weapon. Although US policy-makers were notably concerned about

¹¹⁸ GWAPS, vol. 1, pt. 1: 20-27, 49. OPLAN 1002-88 was predicated on an armed intervention of Soviet Forces as a prelude to and a second front for a global war in Europe. With a change in Soviet relations in 1989, General Powell instructed CINCCENT to develop a plan for intra-regional threats and Iraq, whose armed forces were the largest in the region, was the obvious choice.

¹¹⁹ GWAPS, vol. 2, pt. 2: 313-315.

¹²⁰ GWAPS, vol. 2, pt. 2: 314.

¹²¹ GWAPS, vol. 2, pt. 1: 181.

¹²² GWAPS, vol. 2, pt. 1: 181. Thomas P. Christie and William Barlow made this assessment in “Desert Storm Scud Campaign,” DIA paper P-2661, p I-13.

¹²³ *Ibid.*, 181.

the Scud's political ramifications, CENTCOM did not share this anxiety.¹²⁴ Most US military leaders focused on the Scud's military value. General Horner, for instance, referred to the Scud as "a lousy weapon."¹²⁵ With its modest range, small warhead, and questionable accuracy, the Scud did not pose a credible threat to the military outcome of the war.¹²⁶ CENTCOM's intelligence sources argued that mobile Scud buildup and employment would be very slow and visible to US sensors, thus allowing ample reaction time to vector in attack platforms to destroy the missile on the ground. CENTCOM's pre-war planning for the Scud threat included targeting fixed sites and infrastructure and assigning aircraft patrols to likely mobile launch locations.¹²⁷ Based on the intelligence predictions regarding the mobile Scud employment, CENTCOM deemed these preparations sufficient.

On Day 2 of DESERT STORM, eight Iraqi Scud missiles struck Israel population centers and threatened to dismember the US-led Coalition. Subsequent pressure from Washington proved to CENTAF that it had sorely underestimated the political consequences of the Scud threat.¹²⁸ In all, CENTAF siphoned off almost 2,500 sorties to combat the mobile Scud threat during DESERT STORM that were originally planned for other tasks.¹²⁹ Unfortunately, these actions did not stop Scud launches and, although Coalition forces claimed up to 80 kills against mobile launchers, not a single one could be substantiated after the war.¹³⁰ Overall, CENTCOM's failure to determine the number of mobile Scud launchers, their likely launch locations, and their employment strategy resulted in a tremendous diversion of air assets that produced no verifiable results.

¹²⁴ Ibid., 182.

¹²⁵ Ibid., 182.

¹²⁶ Ibid., 180.

¹²⁷ Ibid., 183.

¹²⁸ GWAPS, vol. 2, pt. 1: 184.

¹²⁹ Ibid., 190. By the end of the war, 20 percent of the F-15E sorties, 2 percent of the A-10 sorties, 4 percent of the F-16 sorties, and 3 percent of the F-11F sorties were used against the Scud threat.

¹³⁰ Ibid., 179. This statistic appeared in a Defense Intelligence Agency report in December, 1991. The report estimated 1,500 sorties actually employed ordnance against some aspect of the Iraq ballistic missile program while an addition 1,000 sorties were use in "Scud patrol" but ended up dropping their ordnance on secondary targets. See also GWAPS, Summary: 84, 88.

The failure to appreciate the Iraqi Scud target set is traceable to one source: CENTCOM overlooked the Scud missile's political value. Because military leaders considered the Scud militarily impotent before the war, a lack of urgency rippled down to intelligence and operations planners, who did not aggressively pursue a pre-war solution.¹³¹ Although a plan was in place to deal with the mobile Scud launches, it paled in comparison to the level of effort that was eventually devoted to the problem. By their own admission, CENTAF leaders failed to appreciate "just how critical the neutralization of the Scud threat was to the civilian leadership and the diplomatic conduct of the war."¹³² Had a sense of urgency to fix the Scud problem existed in the early planning stages of DESERT STORM, it is likely a more effective targeting solution would have been developed.

Issue #3: GATHERING SUFFICIENT DATA: *Insufficient data was collected and analyzed on some targets, which led to unplanned secondary effects.*

The targeting of bridges in Baghdad provides a prime example of how the joint targeting process did not fully analyze some targets during DESERT STORM. The objectives of this target set were (1) to sever fiber-optic cables under the bridge span to disrupt communications, (2) to stem the flow of supplies to the KTO, and (3) to isolate the capital.¹³³ The Iraqi Planning Cell considered isolating the Iraqi leadership to be among its highest priorities during the war. Knocking out communications was a means to this end, but proved to be a far more difficult task than initially thought. In particular, Iraq's fiber-optic network, which was a key link in directing Scud missile attacks, was less vulnerable than intelligence sources had anticipated.¹³⁴ Although the Iraqi Planning Cell knew for some time the location of the central control node for Baghdad's fiber-optic network, for political reasons it was considered off limits as a target. Shortly after the beginning of DESERT STORM, intelligence sources discovered that fiber-optic cables were concealed beneath the bridges in Baghdad. With a critical vulnerability

¹³¹ GWAPS, vol. 1, pt. 1: 104.

¹³² Ibid., 104.

¹³³ GWAPS, vol. 2, pt. 1: 221.

¹³⁴ GWAPS, vol. 2, pt. 2: 286.

finally pinpointed, CENTAF moved quickly to sever the bridges and stem the volley of daily Scud attacks.

Militarily, the targeting of bridges in Baghdad achieved only minor success. Although the Ahar and Al Junhuriyya bridges each received catastrophic damage to one or more major spans, Washington policy-makers ordered CENTAF to cease the bridge attacks to avert collateral damage.¹³⁵ This left the fiber-optic network damaged but still capable, thus failing to achieve the desired effect on Iraqi command and control.¹³⁶ Despite the good intentions of these bridge attacks, close examination of the bomb damage revealed some inadvertent destruction to the Iraqi infrastructure. Unbeknownst to the Iraqi Planning Cell, Baghdad bridges were routinely lined with water and sewage pipes that supported the Iraqi capital, hence causing secondary effects that crippled the water supply and sewage systems.

CENTAF's failure to conduct a complete target development in this case can be traced to the poor working relationship between the Iraqi Planning Cell and CENTAF/IN. The Iraqi Planning Cell's "non-traditional" approach to targeting (functional effects vice destruction), its strategic focus, and the strict security arrangements made the group appear as "elitists". Planners in the cell used a non-standard target numbering technique instead of the universally recognized basic encyclopedia (BE) numbering system, which created confusion and frustration on the part of CENTAF/IN.¹³⁷ Dislocated working arrangements further contributed to the unproductive work environment. Though a seemingly trivial point, the physical separation of the two organizations impeded

¹³⁵ Ibid., 287. CENTAF had planned to target the Sinek, Saddam, and University bridges which planners believed would finally enable them to sever fiber-optic cables, hence degrading the Iraqi leadership's capacity to control military operations including the launching of Scud missiles. The bridge attack in

¹³⁶ Ibid., 288. According to GWAPS: "Even by the final week of the campaign, the destruction and damage that was assessed to have been imposed on these two target sets [leadership and telecommunications/C2] was only partial." GWAPS further concludes that though some disruption and dislocation was imposed on leadership by the attacks on C3, the "regime's ability to function was neither paralyzed nor broken by the time the Coalition's ground offensive began."

¹³⁷ Ibid., 174.

coordination and did little to encourage a closer working relationship.¹³⁸ The cumulative effect was a decidedly uncooperative atmosphere between the Iraqi Planning Cell and CENTAF/IN.

Lacking sufficient intelligence support for its targeting efforts, the Iraqi Planning Cell was forced to rely on what little internal targeting expertise it had. In general, the planners were able to match targets and weapons in a way that achieved the desired effect. But according to Maj John Glock, the only formally trained targeteer in the Iraqi Planning Cell, “Those performing target and weapons selections in the Black Hole were not trained in those military occupational specialties.”¹³⁹ Consequently, many target analyses were incomplete, which led to a number of secondary effects that were not anticipated.¹⁴⁰ In addition, given the large volume of targets each day, there was little time much less the expertise to conduct in-depth target analysis by the thinly manned Iraqi Planning Cell. With an abundance of targeting resources at its disposal, CENTAF/IN was capable of supporting a large portion of the Iraqi Planning Cell’s target analysis requirements.¹⁴¹ Had the two organizations established a more productive working relationship, it is likely that there would have been fewer delinquent target analyses, hence fewer unintended secondary effects. Whether this type of information, in the end, would have altered the decision to target the Baghdad bridges is debatable. However, as a minimum the planners would have had the benefit of understanding the full implications of their actions prior to execution.

¹³⁸ Ibid., 177.

¹³⁹ Ibid., 174.

¹⁴⁰ Joint Targeting School Student Guide, *Target Development Overview*, July 1997, 15-24. Maj John R. Glock, JCS/J-2T, interview with author, 15 January 1999. The Joint Targeting School and the Air Force Targeting School each teach in-depth target analysis techniques. The process is a quantitative evaluation of the target as a member of a system and includes network modeling, program evaluation and review techniques (PERT), and flow chart techniques. This methodology aids the targeteer in gaining a thorough understanding of the target, its critical nodes, its relationship with the target set as a whole, and its connection to the environment. It is through this in-depth target analysis that secondary effects are exposed. According to Major Glock, in the case of the Baghdad bridges, no one in the Iraqi Planning Cell to his knowledge was thinking about secondary effects, particularly on the water system. Most planners, according to Maj Glock, were focussed entirely on “cutting the comms” and nothing else.

¹⁴¹ Maj John R. Glock, JCS/J-2T, interview with author, 15 January 1999.

Issue #4: DESIRED RESULTS ACHIEVED: *The joint targeting process failed to assess targeting results in an effective and timely manner.*

The assessment of targeting results during DESERT STORM was perhaps the most documented ailment in the joint targeting process. Though uncertainty is inherent to all military decision-making in war, most operational commanders in DESERT STORM agreed that BDA did not effectively aid their judgment. CINCCENT, for instance, acknowledged after the war that “BDA was one of the major areas of confusion.”¹⁴² He concluded that conflicting BDA degraded his ability to comprehend whether CENTAF was achieving its objectives in preparation for land operations.¹⁴³ Overall, combat assessment was not able to give the CINC any measure of useful information upon which to base operational decisions—particularly regarding the timing of the ground offensive.¹⁴⁴

OPLAN 1002-90 clearly established CENTCOM/J2 as lead agent for all theater intelligence functions, including liaison with the national intelligence community.¹⁴⁵ However, during the Gulf War CENTCOM/J2 was severely undermanned in BDA expertise and its theater intelligence architecture lacked even minimal computer connectivity with its components. A leadership void was created in CENTCOM’s combat assessment apparatus that forced some components to rely on independent links to national intelligence sources, virtually eliminating any quality control of BDA reporting throughout the theater. Lacking definitive BDA guidance from CENTCOM (i.e. standardized assessment criteria and reporting formats), theater and national level BDA efforts did not necessarily evaluate target damage using the same criteria. Though it is often beneficial to have access to BDA from a variety of sources and methods, nevertheless, a common measuring standard should be coordinated among the contributing agencies to ensure the results are comparable.¹⁴⁶ The dearth of BDA quality

¹⁴² GWAPS, vol. 1, pt. 2: 265.

¹⁴³ Ibid., 266.

¹⁴⁴ Ibid., 265.

¹⁴⁵ Ibid., 271.

¹⁴⁶ Joint Targeting School, *Combat Assessment*, 25 March 1997, 3. Sole source BDA tends to be susceptible to organizational biases and limitations of monocular techniques.

control in inevitably led to reporting that was inconsistent, contradictory, and eventually contentious—especially regarding the KTO.

To conduct BDA more effectively, CENTCOM established a division of labor within the theater: CENTAF assumed responsibility for BDA in Iraq and along the major LOCs leading to the KTO while ARCENT and MARCENT took control of BDA reporting in the KTO.¹⁴⁷ CENTAF created a workable BDA process for joint targeting that included a one hour gross analysis, a four hour refined assessment, and an eight hour “definitive assessment” supplied by the DIA.¹⁴⁸ CENTAF’s BDA procedures relied heavily on imagery analysis to determine whether the target’s physical damage satisfied criteria in the Joint Munitions Effectiveness Manuals (JMEMs). Poor weather early in the air campaign, however, delayed imagery products and caused a major backlog of BDA requests. Further hampering BDA reporting was CENTAF’s lack of experienced collection managers (CM).¹⁴⁹ Many times, CENTAF CMs failed to match requests for national and theater collection with the Iraqi Planning Cell’s targeting list, causing an ineffective flow of imagery. For its part, the Iraqi Planning Cell routinely made last-minute target changes and allowed unit planners to select their own aim-points without relaying these decisions to the collection managers or the BDA analysts.¹⁵⁰ Ultimately, Iraqi Planning Cell planners grew desperate for timely BDA to support ATO production, eventually resorting to unconventional BDA techniques (cockpit video review and direct links with JCS/J2 and Checkmate) to obtain useful information.¹⁵¹

Diversity in BDA reporting can provide the commander with a broader perspective, thus enabling a more comprehensive assessment of the targeting effort. However, to be useful in this regard, these different sources should measure the raw data using the same criteria. For example, standard criteria defining heavy damage, moderate damage, light damage, no damage, severe functional damage, moderate functional damage, light functional damage, and no functional damage will help ensure that BDA from multiple sources is comparable, hence useful.

¹⁴⁷ *Ibid.*, 296.

¹⁴⁸ Lt Col David A. Deptula, transcript from interview with Barry Watts, et al., 20-21 Dec. 1991, 11-14.

¹⁴⁹ GWAPS, vol. 1, pt. 2: 275.

¹⁵⁰ *Ibid.*, 291-292.

¹⁵¹ Lt Col Deptula interview with Barry Watts, 20-21 Dec. 1991, 13.

Although ARCENT and MARCENT exercised primary responsibility for BDA reporting in the KTO, DIA and the Central Intelligence Agency (CIA) also provided their own assessments. CINCCENT’s principal focus prior to ground operations was to reduce the Iraqi Army’s effectiveness by 50 percent. But CENTCOM did not publish procedures or specific criterion for evaluating the Iraqi Army’s “effectiveness”.¹⁵² Consequently, BDA analysts decided to measure the Iraqi Army’s status based on the attrition of hardware (i.e. tanks, artillery pieces, armored personnel carriers).¹⁵³ However, the lack of official equipment damage criteria caused KTO BDA reporting to suffer standardization problems, which led to a wide variety of assessment figures and a great deal of confusion for CENTCOM. (see Table 2).¹⁵⁴

ORGANIZATION	TANKS	ARMORED PERSONNEL CARRIERS	ARTILLERY
JCS/CENTCOM	1,688 (39%)	929 (32%)	1,452 (47%)
CIA	524 (12%)	245 (9%)	255 (8%)

Table 2. Reported Iraqi Equipment Losses: As of 23 Feb 1991

¹⁵² GWAPS, vol. 2, pt. 1: 263. ARCENT and MARCENT relied on theater collection assets, pilot reports, cockpit video, and numbers and types of sorties flown against the Iraqi Army while DIA and CIA used overhead imagery that was susceptible to weather problems and did not have access to cockpit videos and other theater indicators. See also CENTCOM J-5 “After-Action-Report for DESERT STORM,” 14 February 1991, AFHRA NA-259. CENTCOM J-5 concluded in their after-action-report on 21 March 1991, that “BDA compilation and dissemination must be standardized and verified before transmittal to the rest of the headquarters staff.”

¹⁵³ “Operation DESERT STORM: The Plan for the Offensive Campaign, AFHRA TF5-5-123 v.35 p. 84.

¹⁵⁴ GWAPS, vol. 2, pt. 2: 211. See Table 13.

The defects of CENTCOM's combat assessment process resulted in a number of important consequences. First, conflicting BDA caused unnecessary restrike missions that wasted assets and risked additional lives.¹⁵⁵ Second, sufficient data was not available to many combat units for munitions effectiveness assessments (MEA), allowing trends in weapons malfunctions and delivery errors to go unnoticed. The following example highlights the problem:

“General Accounting Office [GAO] analysts argued after the war that SAC imagery analysts could not tell B-52 mission planners whether the bombers were dropping their bombs in an inaccurate but consistent way (and hence in a way that could be corrected). According to the GAO analysts, there was a systematic error, and it was not corrected until the last days of the war. If true, this claim would have an important implication: that only about twenty percent of the unguided bombs dropped by the B-52s (or ten percent of all Air Force munitions expended) were aimed accurately.”¹⁵⁶

As a third consequence, BDA lost its value as a key indicator for initiating the ground offensive. Bombarded by a deluge of BDA reports, CINCCENT became confused and frustrated over the status of the Iraqi Army. At one point, General Schwarzkopf stormed into the TACC and accused General Glosson of “lying” to him regarding the level of effort and the success of airpower in the KTO.¹⁵⁷ Ultimately, the CINC lost faith in KTO BDA reporting and opted to track the number of KTO sorties to estimate the effectiveness of the Iraqi Army.¹⁵⁸

The impediments to accurate and timely combat assessment were both organizational and procedural in nature. Organizationally, CENTCOM/J2 did not provide the leadership or a workable apparatus to manage theater BDA effectively because the process was never exercised during IL-90, which was consistent with the

¹⁵⁵ GWAPS, vol. 1, pt. 2: 283.

¹⁵⁶ GWAPS, vol. 1, pt. 2: 293 Footnote 100.

¹⁵⁷ Major Glock interview with author, 15 Jan. 1999. See also: Rick Atkinson, *Crusade: The Untold Story of the Persian Gulf War*, (Houghton Mifflin Co., Boston, MA, 1993), 106.

¹⁵⁸ GWAPS, vol. 2, pt. 2: 211-212.

long-standing practice of simulating BDA in most training exercises.¹⁵⁹ As the Center of Naval Analysis put it, “The theater BDA process suffered from a cold start, in which the lack of adequate procedures, practice, and manpower were felt.”¹⁶⁰ CENTCOM’s combat assessment architecture was merely a concept; the details of tracking, collating, and disseminating BDA reports had yet to be worked out.¹⁶¹ CENTCOM’s inexperienced and untrained J2 personnel further exacerbated the problem—particularly CMs and imagery analysts. These personnel were wholly unprepared for the enormous volume of imagery and analysis that was required to support targeting efforts in Iraq and the KTO. In addition, the computer-based system for correlating BDA with the ATO failed 45 minutes into the air campaign, forcing inexperienced BDA assessors to track over three thousand BDA reports per day manually.¹⁶² In effect, internal friction overwhelmed the assessment process and constricted the flow of information to mission planners and subordinate combat units. Had combat assessment been exercised rather than simulated during IL-90, CENTCOM/J2 might have exposed and corrected these organizational deficiencies and provided effective intelligence in DESERT STORM.

Procedurally, there was a fundamental misunderstanding between the Iraqi Planning Cell’s effects-based targeting strategy and CENTAF/IN’s destruction-based BDA procedures. The Iraqi Planning Cell used a targeting philosophy designed to generate simultaneous effects across a number of critical enemy systems—often referred to as parallel attack. The overall intent was to quickly degrade enough strategic systems (i.e. leadership, communication, electrical power, and transportation) so that Iraq would be unable to effectively resist. Using this methodology, physical damage to an individual target merely contributed to the ultimate goal of achieving the desired effect on an enemy system. For example, using 8 x F-117s to destroy an enemy’s control bunker is an

¹⁵⁹ Thomas A. Keaney and Eliot A. Cohen, *Revolution in Warfare? Air Power in the Persian Gulf*, (Naval Institute Press, Annapolis, MD, 1995), 120; Maj David L. Glasgow, Joint Targeting School, telephonic interview with author, 21 April 1999. According to these two sources, BDA is routinely simulated during military training exercises to simplify and shorten the scenario.

¹⁶⁰ GWAPS, vol.1, pt. 2: 277.

¹⁶¹ *Ibid.*, 277.

¹⁶² GWAPS, vol. 1, pt. 2: 297.

inefficient use of resources if 2 x F-117s can penetrate the bunker with one or two 2,000-pound bombs and achieve the desired effect of rendering the bunker unusable. But CENTAF combat assessment personnel applied traditional BDA procedures based on physical destruction of the target. Regardless of the effect achieved, if target destruction was not observed in imagery, CENTAF/IN did not remove the target from the master list. The following analysis highlights the problem:

“CENTCOM/J2 provided a target analysis of the impact to date on electric power which basically said that not enough target damage had been done to achieve the objectives. CENTAF/IN’s conclusion was that electric power in Iraq had yet to be seriously affected. But Deptula [Iraqi Planning Cell lead planner] knew from CHECKMATE that there was not an electron flowing by that time, and weather satellites had provided further confirmation (i.e., no lights in Baghdad at night).”¹⁶³

Because not all the power grid aim-points had BDA confirming their destruction, CENTAF/IN was unwilling to assess that the objectives for the Iraq electrical system had been achieved. In essence, BDA measured the means (individual targets) of the targeting strategy, but neglected to assess the broader ends in mind—the desired effects on the targeting system (see Figure 5).

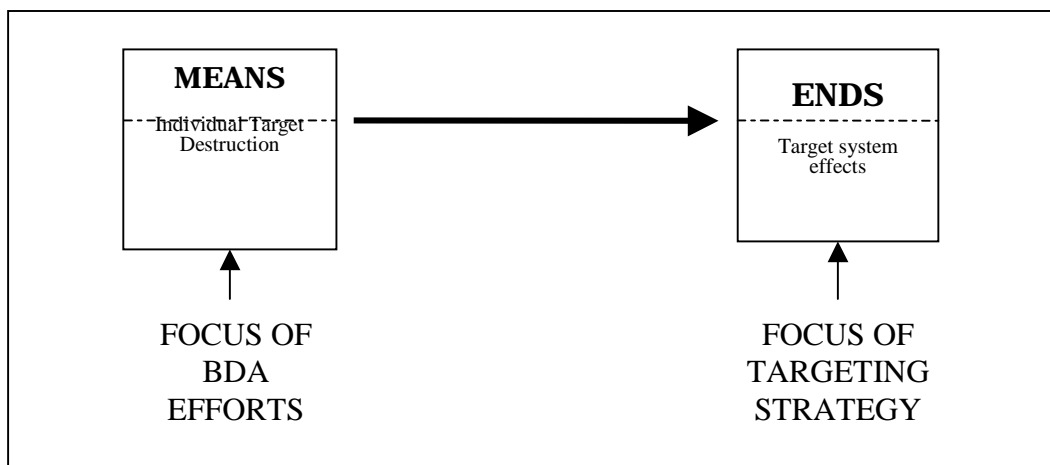


Figure 5. Gulf War Targeting / BDA Relationship

¹⁶³ Lt Col Deptula, transcript of interview with Barry Watts, 20-21 Dec. 1991, 14.

Similarly, BDA in the KTO measured attrition of equipment but CINCCENT was concerned with the broader issue of the Iraqi Army's effectiveness. Combat assessment analysts employed "reductionist" BDA techniques to translate the CINC's guidance into measurable criteria. However, using this methodology the analysts were merely "bean counting" the attrition of the Iraqi Army and ignoring the human dimension—the less tangible aspects such as unit cohesiveness and morale.¹⁶⁴

Though CINCCENT never actually expressed what he expected KTO BDA to provide him, it is apparent that he factored the psychological element into his decision-making. In a revealing episode, General Schwarzkopf, recalling his Vietnam experiences, ordered B-52 airstrikes against the Iraqi Army specifically for the psychological impact of the weapon system and not for the marginal reduction in equipment that its unguided weapons would yield.¹⁶⁵ Although reports after the war indicated their enormous psychological effects, the "bean counting" BDA analysts failed to assess the actual effects of the B-52 missions. With inconsistent BDA reports and assessment methods that ignored the less tangible aspects of DESERT STORM, BDA for the KTO became irrelevant to CINCCENT's decision-making calculus. In sum, while uncertainty in war will always obscure the "ground truth" to commanders to some degree, measuring the appropriate BDA indicators will help reduce its detrimental effects on decision-making.

Summary

Though heralded as a momentous victory, DESERT STORM also demonstrates some of the serious joint targeting challenges that pervade major theater war. Most evident is the difficulty in translating objectives and guidance into supporting targets without violating the policy restraints. The Iraqi infrastructure offered a very appealing method of accomplishing military objectives during the war. However, in many cases the primacy of the military objective either overruled the political restraints or caused targeting planners to overlook the insidious, yet very real secondary consequences. This

¹⁶⁴ GWAPS, vol. 2, pt. 1: 264.

¹⁶⁵ GWAPS, Summary, 155.

led to Iraqi infrastructure damage and noncombatant suffering that exceeded the policy restraints articulated before the war.

Joint targeting during DESERT STORM also suffered from deficiencies in target development, which created systemic blind spots in key areas of Iraq's national power such as its nuclear program and Scud missile capabilities. Iraq's veil of nuclear secrecy coupled with the Cold War paradigm helped keep the lid on Iraq's nuclear program throughout the war. Target development for the mobile Scud threat, in contrast, suffered from a lack of appreciation for the weapon's political value. The targeting of bridges in Baghdad helps illustrate the difficulty in conducting thorough target analyses, particularly when a compelling military requirement is at stake (i.e. the desire to sever fiber-optic cables to stem the launch of Scud missiles). In this case, organizational friction led to a largely uncooperative atmosphere between the Iraqi Planning Cell and CENTAF/IN, which eliminated any useful collaboration regarding target analyses.

Finally, theater combat assessment was unable to provide adequate and timely information needed to appraise targeting effects and assist in decision making. CENTCOM's failure to exercise its combat assessment apparatus prior to DESERT STORM led to a collapse of the organizational structure for theater BDA reporting. Procedurally, discrepancies between targeting strategies and BDA methodology also hampered decision making in the air campaign and ultimately led to the demise of BDA as a dominant indicator for the land campaign. Although flawless BDA is a wholly unrealistic expectation in any war, measuring the appropriate indicators is an important first step towards obtaining BDA that can effectively aid decision-makers.

CHAPTER 4

JOINT TARGETING IN LIMITED THEATER WAR: *BOMBING FOR PEACEFUL PURPOSES*

It may not have been an efficient use of airpower, but it was effective.

—General Michael E. Ryan

At 0140 CET on 30 August 1995, Maj Gen Hal Hornburg, director of the Combined Air Operations Center (CAOC) at Vincenza, Italy, cleared the first group of 60 strike aircraft “feet dry” into Bosnia, thus signaling the start of Operation DELIBERATE FORCE.¹⁶⁶ With confirmation that the 28 August deadly mortar attack on Sarajevo’s Mrkale marketplace was of Serb origin, UN and NATO forces sprang into action against the Bosnian Serb Army.¹⁶⁷ NATO launched DELIBERATE FORCE in support of UN peace operations to decrease the Bosnian Serb military advantage and protect UN-designated safe areas in hopes of halting the bloodshed in the war-torn country. In this regard, DELIBERATE FORCE was both a peacemaking and peace-enforcement operation, forcing the two-week operation to navigate a tenuous line of impartiality.¹⁶⁸

¹⁶⁶ Mark J. Conversino, et al. *DELIBERATE FORCE: A Case Study in Effective Air Campaigning*, (Air University Press, Maxwell Air Force Base, AL, 1998), 5-3. (From here forward this report will be referred to as BACS).

¹⁶⁷ “Allied Forces Southern Europe: Fact Sheet,” *Federation of American Scientists*, 3 September 1996, n.p.; on-line, Internet, 12 January 1999, available from <http://www.fas.org/man/dod-101/ops/Deliberateforce.htm>. NATO contributed 292 aircraft, flew 3515 sorties, and dropped 1026 bombs during DELIBERATE FORCE. Though not considered a part of DELIBERATE FORCE, the UN supplied a Rapid Reaction Force that employed artillery against the Bosnian Serbs throughout the operation.

¹⁶⁸ John A. Tirpack, “Deliberate Force,” *Air Force Magazine* (October, 1997), 41. According to Lt Gen Michael E. Ryan, commander of AIRSOUTH, “We were not at war with any faction, and that included the Bosnian Serbs.”

For the first 48 hours of the operation, NATO aircraft pounded key Bosnian Serb military positions throughout southeastern Bosnia. On 1 September, NATO temporarily halted the bombing to assess the Serb reaction, but resumed attacks on 4 September after it became clear the Bosnian Serbs were unwilling to comply with the UN-brokered Framework Agreement.¹⁶⁹ NATO air forces again suspended offensive combat operations against the Bosnian Serb Army on 14 September after the warring factions agreed to the conditions of the UN peace arrangement. On 20 September, UN and NATO military commanders confirmed that Bosnian Serb forces had substantially complied with the Framework Agreement, prompting a permanent cease-fire that ended the NATO air campaign. Despite the ambiguous mission and the complexities of multinational and multi-organizational operations, DELIBERATE FORCE played a key role in terminating the bloodshed in Bosnia and securing a lasting peace under the Dayton Peace Accords.

Joint Targeting In Deliberate Force

The genesis of joint targeting in DELIBERATE FORCE can be traced to NATO's regional OPLAN 40101, DENY FLIGHT. This early-1993 plan established official liaison between NATO and the UN and formalized NATO's support for the UN mission in Bosnia. With growing concern over the hostilities in Bosnia, UN Security Council Resolution 836 was adopted in late-1993, which made clear the legitimacy and urgency of NATO airstrikes to deter future attacks against UN forces. NATO planners responded by revising OPLAN 40101, giving it a more proactive response to Serb aggression with the so-called "Operational Options for Air Strikes in Bosnia."¹⁷⁰ Over the following two years, NATO exercised its authority under the UN by implementing a number of sporadic "pin-prick" attacks designed to retaliate for Serbian regional aggression.

Planners at AIRSOUTH, NATO's military component directly responsible for air operations in Bosnia, began a piecemeal process of developing targets for the expanding NATO's mission in Bosnia. Eventually, planners compiled a master target base (MTB)

¹⁶⁹ "Allied Forces Southern Europe: Fact Sheet"

¹⁷⁰ BACS, 4-7.

totaling 444 targets that provided a menu to support various UN requirements in Bosnia. The Joint Analysis Center at RAF Molesworth maintained the master list of targets, which became the single source document for all subsequent NATO targeting efforts in Bosnia.

Within UN guidelines, NATO began a series of deliberate planning efforts that drew targets from the master target list. In December 1994, NATO crafted an air defense suppression (SEAD) campaign call Operation DEAD EYE in response to the growing air threat.¹⁷¹ Near this same time, NATO planners developed contingency plans to protect UN-designated safe areas in and around Sarajevo, Tuzla, Bihac, and Gorazde.¹⁷² Later, NATO planning efforts merged the safe area contingency plans in the southeastern region of Bosnia with portions of DEAD EYE into a single plan—Operation VULCAN.¹⁷³ In response to further Serb provocation in the spring of 1995, Lt Gen Michael E. Ryan, commander of AIRSOUTH (COMAIRSOUTH), ordered the planning of a full-scale air campaign plan called “NATO air operations in Bosnia.”¹⁷⁴ This plan, which incorporated elements of OPLAN 40101, DEAD EYE, and VULCAN, was the forerunner for what eventually became Operation DELIBERATE FORCE.

AIRSOUTH planners subdivided DELIBERATE FORCE into targeting “Options” that provided a “robust and graduated” capability for NATO.¹⁷⁵ These “Options” included: Option 1 (first strike phase): low risk, low collateral damage targets designed as a demonstration, Option 2 (initial follow-on phase): medium risk, medium collateral damage targets specifically designed to relieve the Bosnian Serb Army siege on designated safe areas, and Option 3 (extended operations phase): expanded operations throughout Bosnia to include infrastructure targeting.¹⁷⁶ Near the completion of DELIBERATE FORCE planning, Admiral Smith (CINCSOUTH, commander of all NATO forces supporting Bosnia), convened a joint targeting board (JTB) to finalize the target list. Lacking specific UN objectives for the looming air operation, the board

¹⁷¹ BACS, 8-38.

¹⁷² BACS, 8-40.

¹⁷³ BACS, 4-9, 4-10.

¹⁷⁴ BACS, 4-8.

¹⁷⁵ BACS, 8-42.

¹⁷⁶ BACS, 8-41.

approved 158 targets based on the “most significant active targets” in Bosnia.¹⁷⁷ Admiral Smith forwarded the target list to senior NATO and UN officials where it gained final approval on 14 August.

By late-August, rising tensions in Bosnia made NATO military action appear imminent. COMAIRSOUTH moved quickly to finalize NATO preparations by selecting 87 targets from the approved target list for DELIBERATE FORCE.¹⁷⁸ Ultimately, the AIRSOUTH target list was capped at 56 total targets, which included 346 associated aim-points.¹⁷⁹ This list covered a limited number of Option 1 targets while the rest were Option 2 aim-points.¹⁸⁰ No Option 3 targets were approved for DELIBERATE FORCE.¹⁸¹ To shore-up targeting cooperation within Bosnia, COMAIRSOUTH and the UN ground force commander signed the AIR-LAND Coordination Document.¹⁸² Although principally an anti-fratricide measure, the agreement also served as a means for the ground troops to nominate targets to the CAOC.¹⁸³

¹⁷⁷ Lt Col Robert Wallace, 354th OSS/IN, telephonic interview with author, 8 March 1999. According to the BACS (4-11), the number of targets approved by the JTB was 151. Since Lt Col Wallace attended the meeting, his information is likely more accurate.

¹⁷⁸ BACS, 8-41.

¹⁷⁹ BACS, 8-45. Although commonly referred to as DELIBERATE FORCE, the actual plan executed by AIRSOUTH was a combination of DELIBERATE FORCE and DEAD EYE. DELIBERATE FORCE accounted for 21 targets, DEAD EYE SE had 15 targets, DEAD EYE NW had 5 targets, and the remaining 15 targets were supporting LOCs bring the total to 56. For ease of discussion, this study will refer to this list simply as the DELIBERATE FORCE master target list.

¹⁸⁰ BACS, 4-11.

¹⁸¹ BACS, 12-24.

¹⁸² BACS, 2-9.

¹⁸³ BACS, 4-10.

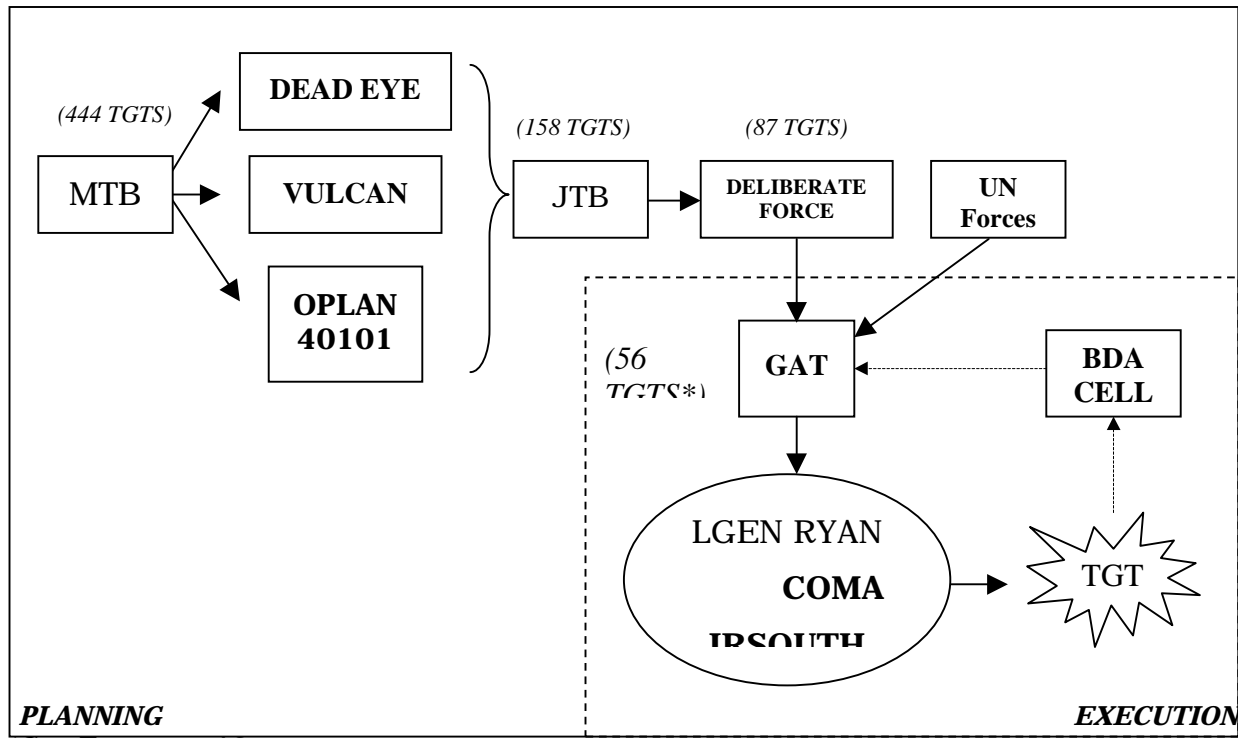


Figure 6. Operation DELIBERATE FORCE targeting evolution

During DELIBERATE FORCE, the relatively low volume of daily targets (typically 10 to 20) made it possible for General Ryan to manage all aim-point selections personally.¹⁸⁴ On a daily basis, the CAOC's guidance, apportionment, and targeting (GAT) cell evaluated the targeting list based on the latest BDA reports to confirm which targets needed to be attacked during the next targeting cycle. Each target was then briefed in detail to General Ryan, who subsequently approved the individual aim-points (see Figure 6).¹⁸⁵ During the approval process, General Ryan carefully evaluated each

¹⁸⁴ Lt Col David Minster, 13th AF/IN, telephonic interview with author, 7 March 1999.

¹⁸⁵ Maj Anthony C. Thomas, Air Staff/XOI Chief of Targeting Branch. Telephonic interview with author regarding Operation DELIBERATE FORCE, 9 Mar 1999. Maj Thomas was the principal targeting officer in the CAOC during Operation DELIBERATE FORCE. He related that the guidance, apportionment, and targeting cell (GAT) within the CAOC consisted of a few targeting officers, operations planners, and liaison officers. Normally, Maj Thomas and three other GAT planners would brief Col Zeorb and General Ryan on the daily target nominations. Maj Thomas stated that to facilitate aim-point selection, the weapons and delivery platforms were assigned before

attack for its collateral damage potential and issued guidance on delivery profiles and tactics to absolutely minimize the chance of unintended consequences. Due to the perceived political sensitivities, achieving the desired effect on any given target was clearly subordinate to collateral damage concerns and the projected political fallout.¹⁸⁶

How did joint targeting measure up?

According to NATO planning documents, the military objective and desired end-state for DELIBERATE FORCE were:

Military Objective: “Execute a robust NATO air campaign that adversely alters the Bosnian Serb Army’s advantage in conducting successful military operations against the BiH [Bosnian forces].”¹⁸⁷

Desired End-state: “Bosnian Serbs sue for cessation of military operations, comply with UN mandates, and negotiate.”¹⁸⁸

In terms of the military objective, the joint targeting process enjoyed a great deal of success during DELIBERATE FORCE. Of the 56 targets, only eight had not been either seriously damaged or completely destroyed by the end of the campaign—all in just 12 days of bombing.¹⁸⁹ Moreover, 338 of the 346 aim-points were attacked during the campaign, of which 308 (89 percent) sustained serious damage according to the CAOC.¹⁹⁰ Targeting the Serbian IADS was particularly effective during the operation

hand so that when General Ryan approved the nominations, the list was nearly ready to be converted into an air tasking message.

¹⁸⁶ BACS, 5-15. The overwhelming desire to avoid collateral damage (of non-combatants as well as Serbian military personnel) played a pivotal role in the prosecution of DELIBERATE FORCE. NATO commanders wanted to avoid a “CNN incident” that might portray to Pale, Belgrade, or even Moscow that the allies were belligerents fighting on the side of the Croats and Bosnian Muslims. This restriction was so well observed that pilots were instructed to only drop their ordnance if they could positively identify the target. Likewise, pilots who could not positively identify their targets were instructed to either bring their ordnance home or jettison them into the Adriatic Sea. See also Tirpak, 43. After the war, General Ryan noted: “Minimizing not only collateral damage but also carnage was first and foremost in my mind.”

¹⁸⁷ BACS, 7-1.

¹⁸⁸ BACS, 4-1.

¹⁸⁹ BACS, 4-16.

¹⁹⁰ BACS, 12-15.

and helped NATO avoid costly aircraft losses.¹⁹¹ Joint targeting was also successful in suppressing Serb shelling of the Sarajevo safe area and helped degrade the Bosnian Serb Army sufficient to prompt a complete withdrawal of heavy weapons from that area.¹⁹² Perhaps the most remarkable achievement of NATO's targeting effort, however, was the low number of casualties and collateral damage. NATO's liberal use of precision weapons, highly accurate aircraft, and strict rules of engagement allowed DELIBERATE FORCE to bypass many of the collateral damage issues that impacted other military operations.¹⁹³ Even the Serb leaders were amazed; President Slobodan Milosevic flatly told his Bosnian Serb Army commander to "Shut up" when he tried to raise the issue of collateral damage at the Dayton meeting.¹⁹⁴ Obviously, the lack of significant collateral damage severely undercut any attempt by the Serbs to manipulate the negotiations, hence simplifying the peace process.

Viewed within the context of the desired end-state, the achievements of joint targeting are not so well defined. Because the Bosnian Serb's compliance with UN-brokered demands on 20 September roughly coincided with the 14 September bombing halt, a cursory view may lead one to conclude that DELIBERATE FORCE was decisive in the outcome. However, a concurrent but unrelated military ground campaign spearheaded by Croat/Bosnian Muslim (Federation) ground troops also exacted a heavy toll on the Bosnian Serb Army during the NATO operation. This five-month Federation ground offensive reclaimed roughly 30 percent of Serbian occupied territory in western

¹⁹¹ BACS, 5-4. One aircraft was shot down during the conflict; a French Mirage 2000, callsign Embro 33. This aircraft, however, was downed by a MANPAD, which is not considered part of IADS.

¹⁹² Ibid.

¹⁹³ BACS, 8-28 – 30. NATO aircraft employed 708 precision weapons and 318 non-precision weapons during DELIBERATE FORCE. Initially a worry, NATO aircraft such as Dutch F-16s, who were unable to employ precision weapons, proved themselves worthy in dropping non-precision weapons. The strict ROE imposed by COMAIRSOUTH ensured aircrews did not release their ordnance unless positive identification of the target was obtained.

¹⁹⁴ Beale, 37. According to Serb sources, only twenty five people lost their lives during DELIBERATE FORCE—a very low figure considering the almost 1100 bombs were dropped during the campaign.

Bosnia and by the end of DELIBERATE FORCE, was seriously threatening the Serb's historic "fear of domination."¹⁹⁵

Political and economic alienation also played a substantial role in compelling the Bosnian Serbs to negotiate. UN imposed sanctions against Serbia, which were in response to Serb aggression in Bosnia, had a detrimental affect on the frail Serbian economy. As a result, President Melosevic and other Serb leaders began to distance themselves from the Bosnian Serb Army and eventually terminated all Serbian aid to the forces in Bosnia.¹⁹⁶ With its logistical stockpiles dwindling and political support waning, the Bosnian Serb Army appeared ripe for a collapse at the outset of the air campaign.

The existence of these contextual factors tends to complicate any definitive evaluation of the joint targeting process in DELIBERATE FORCE. Whereas the Federation land offensive was aimed at overrunning Serb-held territory in Bosnia, joint targeting in DELIBERATE FORCE sought to influence the Bosnian Serb forces through attacks on command and control, logistics, and its mobility underpinnings (Option 1 and Option 2 targets).¹⁹⁷ Although the targeting effort struck a serious blow to the Bosnian Serb's offensive capability, the strategy was not designed to reduce Serbian-held territory in Bosnia. Therefore, viewed within the context of the Serb's historic "fear of domination", the land offensive may have provided a greater incentive for the Serbs to negotiate.¹⁹⁸ One regional specialist, Norman Cigar, contended that the Federation ground offensive confirmed for the Serbs that they were losing control of the military

¹⁹⁵ BACS, 12-21. Planners during Operation DELIBERATE FORCE commonly regarded the Serb's historic "fear of domination" as their center-of-gravity, though the validity of this assertion is difficult to prove and certainly debatable.

¹⁹⁶ Beale, 46.

¹⁹⁷ BACS, 8-46.

¹⁹⁸ BACS, 12-21. According to the BACS, "...the Bosnian Federation offensive established a division of territory between it and the Serb faction that almost exactly equaled the 51/49 percent split called for in intervention peace plans, and reconfirmed at the Geneva peace talks on 8 September 1995. Ambassador Holbrooke maintained that this event greatly eased the subsequent peace negotiations at Dayton, Ohio, since this placed the Serbs in the position of merely acknowledging an existing division of territory, rather than in a position of giving up hard-won territory that they previously had refused to relinquish."

situation.¹⁹⁹ In his view, the air campaign, and hence joint targeting, was relatively meaningless in the ultimate outcome.²⁰⁰ General Hornburg observed a synergistic effect in the campaign: “without the territory loss, the air campaign would not have been as effective...One without the other would not have been as effective.”²⁰¹ Without confirmation from the Serb leaders themselves, however, any attempt to judge the independent effectiveness of the Federation land offensive, political and economic isolation by Serbia, and the targeting effort in DELIBERATE FORCE is likely to be speculative.

Joint Targeting Deficiencies

Three major joint targeting problems occurred during DELIBERATE FORCE that deviated from the scientific problem-solving methodology.

Issue #1: DEFINING THE PROBLEM: *The planning and execution of the joint targeting process was not in complete agreement with the desired results.*

In the two years leading up to DELIBERATE FORCE, NATO’s military mission in Bosnia was ensnared in political uncertainty.²⁰² The blurry distinction between peacekeeping and peace-enforcing was not conducive to a clear purpose for NATO airpower, making the “pin-prick” airstrikes during DENY FLIGHT appear almost haphazard. In the realm of peacekeeping and peace-enforcement operations, governments tend to be hesitant to articulate objectives that risk a long-term commitment; preferring instead the flexibility of vague goals.²⁰³ This flexible approach is reflected in the words of NATO Secretary General Manfred Wornier, who stated in late-1993: “...the purpose of intervention is not necessarily to win a war, but to influence the behavior of the party concerned. We need to have limited military options for limited political or diplomatic

¹⁹⁹ BACS, 12-21

²⁰⁰ Ibid.

²⁰¹ BACS, 7-3.

²⁰² Tony Mason, *Air Power: A Centennial Appraisal*, (Brassey’s, London, 1994), 182.

²⁰³ Mason, 185.

objectives. It is wrong to think only in categories of all or nothing...’’²⁰⁴ It was with this contextual “baggage” that NATO planned and executed DELIBERATE FORCE.

The consensus within the North Atlantic Council in the summer of 1995 was that NATO military action should be used solely to protect UN-designated safe areas threatened by the Serbs.²⁰⁵ US Ambassador Hunter explicitly stated that NATO bombing had to be “represented” merely as an effort to protect the safe areas.²⁰⁶ He further iterated that there was “no overt general commitment” to bomb the Bosnian Serbs into talking.²⁰⁷ Of the 56 targets selected by General Ryan for DELIBERATE FORCE, most were in direct support of NATO’s military objective. A close look at the target list reveals an obvious attempt to target the Bosnian Serb Army’s offensive capability and prevent the Serbs from achieving their objective—conquering the safe areas.²⁰⁸ By all outward appearances, therefore, NATO’s targeting effort was designed to achieve the military aim.

In contrast to the military objective, NATO’s desired end-state for DELIBERATE FORCE called for Serbian political concessions.²⁰⁹ Under the terms of this end-state, the Serbs were not only required to surrender their claims on the safe areas, but relinquish previously conquered land in Bosnia.²¹⁰ The joint targeting process in DELIBERATE FORCE was planned and executed to secure the UN-designated safe areas. Coercing the Serbs into concessions regarding other territory within Bosnia was not premeditated.

²⁰⁴ Ibid.

²⁰⁵ BACS, 12-20. The North Atlantic Council (NAC) is the authoritative body within NATO for the employment of military forces.

²⁰⁶ BACS, 12-20.

²⁰⁷ BACS, 12-20.

²⁰⁸ BACS, 8-41. The major targeting categories for DELIBERATE FORCE were Fielded Forces, Direct and Essential Military Support, Command, Control, and Communications, IADS, and Infrastructure. These were all tied directly to the safe areas of Gorazde, Sarajevo, Tuzla, and Bihac, thus linking them directly to achieving the military objective. During DELIBERATE FORCE, the central focus was in the southeastern portion of the country, where the safe areas of Tuzla, Gorazde, and Sarajevo were located. See Figure 9-5 on BACS 8-41 and Figure 9-7 on BACS 8-39/40 for more information.

²⁰⁹ BACS, 12-20.

²¹⁰ BACS, 12-21-22. UN mandates called for a roughly 51/40 percent split in Bosnian Serb / Bosnian Muslim and Croat occupied land. Prior to hostilities, the Bosnian Serbs occupied about 71 percent of Bosnia.

NATO's end-state, as appealing as it was for diplomatic negotiators, clearly exceeded the military objective for DELIBERATE FORCE.²¹¹ In fact, it even contradicted both Ambassador Hunter's statement that there was no "overt general commitment" to bomb the Serbs into talking and the explicit desires of the North Atlantic Council. Nevertheless, the measure of merit used to assess the joint targeting process during DELIBERATE FORCE was the desired end-state.²¹² This unbalanced and somewhat contradictory relationship between the objective and the end-state led to targeting problems in planning and execution that were disguised by the apparent success of DELIBERATE FORCE, but were present nonetheless.

In a revealing incident near the end of DELIBERATE FORCE, COMAIRSOUTH became "very concerned" that NATO was running out of targets to support the desired end-state.²¹³ With the current target list almost depleted and the approval of Option 3 targets very unlikely, COMAIRSOUTH's alternatives for extending the targeting effort to effect Serb compliance were unappealing.²¹⁴ In effect, NATO was nearing the completion of its military objective while the desired end-state was still in considerable doubt. In the end, NATO's targeting effort did succeed in helping force the Serbs to the negotiating table. But, how this scenario might have played itself out had there not been a concurrent Federation land campaign casts doubts on the targeting prowess of DELIBERATE FORCE.

Failure to gain a consensus between the military objective and the desired end-state resulted in a mismatch between the UN's diplomatic efforts and NATO's military activities. An undercurrent of apprehension existed within senior AIRSOUTH leadership

²¹¹ BACS, 12-20.

²¹² BACS, 4-15. The BACS concludes: "The ability to measure the effectiveness of an air campaign is often elusive. Moreover, in an operation in which the success or lack of it cannot be quantified in traditional terms (e.g. body counts, enemy unit combat effectiveness ratings, aircraft shot down), measures of merit were particularly difficult to establish. In addition, subdivision of the campaign into phases measured prosecution of the various established target sets. Although not explicitly defined by beginning and end points, the phases corresponded to the target sets that supported the identified Bosnian Serb center of gravity. The overall progress of the air campaign was measured primarily against the desire End-state."

²¹³ BACS, 4-16.

²¹⁴ BACS 5-15.

regarding the possibility that political leaders might quickly “turn off” DELIBERATE FORCE after getting a whiff of the bombing.²¹⁵ General Ryan, therefore, pressed the targeting efforts in the initial stages to accomplish as much of the military mission as possible prior to a pre-mature shutdown.²¹⁶ Ironically, the UN diplomatic efforts headed by Ambassador Richard Holbrooke hoped that the NATO air campaign would give them long-term leverage against their Serb counterparts.²¹⁷ With word that DELIBERATE FORCE was about to run out of targets, Holbrooke rushed to Belgrade to extract the best deal possible before the bombing ended.²¹⁸ Although Holbrooke did obtain Serb promises to participate in “some sort of peace conference,”²¹⁹ he later confessed that “if [Admiral] Smith and [General] Joulwan had said boy we have a lot of great targets left out there,” his leverage to secure a definite agreement in Belgrade would have been enhanced.²²⁰

Although the UN-NATO relationship is perhaps a unique geo-political arrangement, the impediments that affected the joint targeting cycle in this situation are worth noting. Communication failures between the UN and NATO appear to be the culprit behind the inconsistent aims of DELIBERATE FORCE. In the two and one-half years preceding this NATO military action, there were numerous periods of uncertainty regarding NATO’s strategic purpose in the Balkans.²²¹ This pattern of ambiguous aims characterized the preparations for and execution of DELIBERATE FORCE. In an attempt to bring clarity to the NATO mission, NATO and UN military leaders signed a

²¹⁵ BACS, 4-15.

²¹⁶ BACS, 4-15.

²¹⁷ BACS, 12-24. Ambassador Holbrooke headed the Contact Group which was the diplomatic agent working on behalf of the UN. Holbrooke and his group were the only negotiators that dealt directly with the Serbian political leadership.

²¹⁸ BACS, 12-24.

²¹⁹ Ibid.

²²⁰ Ibid. According to BACS: “As an example of the permeability of NATO security in this issue [running short of targets], Time Magazine published an article, “More Talking, More Fighting,” on 18 September, p. 76-7, that was clearly written before the results of the 13-14 September meeting were known and that said explicitly that “the allies will run out of so-called Option 2 targets—as early as next week,” and that a decision to move to Option III presented NATO with “a problem.” It is, therefore, reasonable to speculate that the Serbs also had access to this information.

²²¹ BACS, 4-17.

Memorandum of Understanding on 14 August, which outlined NATO's military intentions and desired end-state in case a conflict broke out.²²² However, for undisclosed reasons the UN altered the end-state in the days preceding the operation to include "compelling the Bosnian Serbs to negotiate."²²³ This change was made in the aftermath of the target selections for DELIBERATE FORCE and was not accompanied by a change in NATO's military objective.²²⁴ Consequently, the joint targeting process supported NATO's military objective, but was only serendipitously linked to the UN's diplomatic activities and the desired end-state.²²⁵ Had the UN's explicit intentions for NATO been more forth coming, the targeting process could have been more effectively planned and executed to achieve the desired end-state without needing help from a fortuitous ground operation.²²⁶

Issue #2: DEFINING THE PROBLEM: *Some targets were attacked during DELIBERATE FORCE that did not seem to support NATO's military objective.*

Throughout the planning of DELIBERATE FORCE, AIRSOUTH considered bridges an Option 3 target set that had little chance of being approved by the North Atlantic Council. Their value to the economic well being of the region as well as the high density of civilian traffic made bridges uninviting targets.²²⁷ The perception of bridges changed, however, when the UN land force commander wanted to restrict the

²²² Ibid.

²²³ Ibid.

²²⁴ Ibid.

²²⁵ BACS, 12-27. General Ryan suggested after the war that the real reason that the UN and NATO seemed out of sync militarily and diplomatically was the possible inadequacy of information flow between the North Atlantic Council and UN leaders.

²²⁶ This discussion is presented not to side with the military objective or the desired end-state, but rather, to point out that the two were not entirely congruent. It would be pure speculation, of course, to suggest ways that the targeting process may have been altered to achieve the end-state. The targeting dilemma that faced AIRSOUTH in the waning moments of DELIBERATE FORCE did not pertain to target selection, but rather, target volume. Had the military objective been broad enough to justify Option 3 targets, the joint targeting process would have had at its disposal many more targets from which to choose. In this way, the targeting efforts could have comfortably been extended, thus better supporting the desired end-state.

²²⁷ BACS, 8-46.

movement of the Bosnian Serb Army in and out of the safe areas.²²⁸ Later, the UN commander proposed destroying bridges as a means of “channeling” the flow of Serb heavy weapons to the designated containment areas for accounting reasons. Lacking a better approach, AIRSOUTH, in close coordination with UN land forces, gained approval to target selected bridges.

Militarily, the targeting of bridges did not achieve the intended result. Only seven of the 12 bridges targeted by AIRSOUTH actually received the desired level of damage.²²⁹ Some of the bridges targeted were incapable of supporting heavy weapons, making their destruction meaningless with respect to the intent.²³⁰ In addition, at least one bridge attack (by an F-15E) accidentally caused collateral damage to a nearby farmhouse, which led to stricter bombing restrictions from the CAOC.²³¹ One year later, Red Cross officials investigating the bridge bombings noted that the attacks had severed water lines contained within some bridges, confirming additional infrastructure damage.²³²

AIRSOUTH’s failure to consider NATO’s military objective during the selection of these particular targets allowed the targeting process to stray from its defined purpose.²³³ Though the targeting of bridges to restrict Bosnian Serb Army movements in and around the UN safe areas was relevant to NATO’s military objective, dropping bridges for the purpose of counting Serb heavy weapons is a very tenuous match. The risk of collateral damage, let alone the risk to the aircrew, does not seem to have been consistent with the military gains in this particular case. Although the accountability of

²²⁸ BACS, 5-10.

²²⁹ BACS, 5-10.

²³⁰ Lt Col David Minster, Andersen AFB, Guam, telephonic interview with author, 7 March 1999.

²³¹ *Ibid.*

²³² Lt Col Robert Wallace, 354th Wing Intelligence, telephonic interview with the author, 8 March 1999.

²³³ Maj Anthony C. Thomas, Air Staff/XOI Chief of Targeting Branch. Telephonic interview with author regarding Operation DELIBERATE FORCE, 9 Mar 1999. Maj Thomas states that those CAOC planners that selected the bridges seemed to be caught up in the moment and forgot about the real purpose of the mission (NATO’s military objective).

the Serb's heavy weapons was a UN concern, this tasking clearly exceeded the purview of NATO's military objective.

Issue #3: DESIRED RESULTS ACHIEVED: *The joint targeting process failed to assess targeting results in an effective and timely manner.*

In the two years prior to DELIBERATE FORCE, the CAOC's combat assessment apparatus suffered from undermanning, untrained personnel, and a lack of organic computer systems. The vast majority of NATO personnel came to the CAOC on temporary duty, most having no experience in BDA reporting.²³⁴ The lack of permanent party corporate knowledge and dedicated computer systems led to chronic training problems for BDA augmentees.²³⁵ Some organizational procedures were implemented in 1994 to help build a coherent BDA reporting structure, but the process only received attention during the infrequent "pin-prick" attacks that NATO undertook during DENY FLIGHT.²³⁶ In short, the CAOC's combat assessment apparatus did not maintain a high state of readiness and was generally ill prepared for any short-notice BDA requirement.²³⁷

The focal point for all theater combat assessment in DELIBERATE FORCE was the CAOC's BDA Cell. Designed to be a fusion center for collection and reporting, the cell created links with the CIA, DIA, National Security Agency, JCS/J-2T, theater collection resources, subordinate combat units, and UN observers on the ground to facilitate the assessment process.²³⁸ In theory, overhead imagery, tactical collection (HUMINT, SIGINT, IMINT), cockpit video, and mission reports were all supposed to be fused by the BDA cell, analyzed, processed, and rapidly disseminated to the field.²³⁹ However, this task proved to be very formidable.

²³⁴ BACS, 6-3.

²³⁵ Ibid.

²³⁶ BACS, 6-2. Lt Col Dave Minster, 13th AF/IN, telephonic interview with author, 8 Mar 1999.

²³⁷ BACS, 6-2.

²³⁸ BACS, 6-3.

²³⁹ HUMINT is intelligence collected from human sources, SIGINT is intelligence collected from signals (for example communications), and IMINT is intelligence collected from imagery.

BDA reporting during DELIBERATE FORCE suffered from some notable deficiencies. Manned initially by four partially trained analysts and hampered by poor weather early in the conflict, BDA efforts in DELIBERATE FORCE quickly fell 48 hours behind the operational pace.²⁴⁰ Fortunately, six augmentees from the 32 Air Operations Group (AOG) and a steady influx of high-tech automated systems partly reversed the shortfalls in BDA reporting. Despite the added manning and equipment, however, BDA expertise remained a nagging concern and led to some “non-standard” workarounds. One CAOC targeting officer familiar with the process recalls:

“No one was slated to perform functional or target system analysis because with air supremacy and the ability to perform what amounted to saturation bombing, albeit with smart bombs, it was easier to continue to hit known, approved targets than identify new targets that might function as backups for the destroyed targets.”²⁴¹

In other words, because BDA expertise was insufficient for the task, it was easier to strike a target multiple times to ensure the effect was achieved than to conduct in-depth analysis after the first strike to determine the result.

In addition, the CAOC’s collection capabilities had trouble keeping pace with the operational tempo of DELIBERATE FORCE. In particular, the large volume of last minute target changes (referred to by the CAOC as “dynamic” aircraft retasking) was difficult for collection assets to support. With theater collection operating at near capacity, the frequent retasking of strike aircraft put the CMs and BDA Cell analysts at the mercy of slower reacting national systems. Consequently, many of the targets tasked at short notice by the CAOC received delayed collection and BDA reporting. The significant backlog in BDA reporting did not provide a coherent appraisal of the targeting efforts in the operation. The 32nd AOG captured the issue in their after-action-report: “The CAOC...did not close the ATM loop (cycle) with a unified assessment of operational results.”²⁴² In sum, with the BDA apparatus unable to effectively evaluate

²⁴⁰ BACS, 6-3. The scope and scale of the air campaign initially overwhelmed the BDA cell. For example, it took up to 48 hours for the first BDA reports to feed back into the daily targeting cycle.

²⁴¹ BACS, 6-4.

²⁴² BACS, 6-4.

the targeting efforts, COMAIRSOUTH developed his own personal criteria and assumed control of the assessment process.²⁴³

Due the perceived political sensitivities, the CAOC was ordered to report BDA only to AIRSOUTH's immediate boss, Admiral Smith, who retained sole authority for internal and external BDA reporting.²⁴⁴ Unlike the constricted flow of assessment information caused by internal friction in DESERT STORM, the blockage in DELIBERATE FORCE was intentional. NATO military commanders weighed the implications of the contextual environment (potential political reactions, operational security concerns) with the necessities of execution (feedback to units and higher commands) and determined contextual concerns to be more problematic. Although this decision appears to be based on sound judgement, it is important to note the lack of BDA information did cause problems and frustration at the unit level.²⁴⁵

Deficiencies in the assessment process had several consequences. First, several redundant airstrikes were flown during DELIBERATE FORCE, especially early in the campaign when BDA reporting significantly trailed the operational tempo.²⁴⁶ Personnel at the 31st Fighter Wing at Aviano Air Base, Italy were particularly frustrated with the lack of BDA that led to redundant attacks.

“Not knowing the situation on the ground had specific meaning for Captain Hallisey [31st Intelligence officer], who noted that, while the ATM might direct a particular flight to hit DMPIs [aim-points] three and four at a particular target, the actual pilots might see those DMPIs as the first and second air-points, since they had no pre-strike BDA photos to show them that previous strikes had obliterated the original DMPIs one and two.”²⁴⁷

Given the limitations of pre-strike target information from the CAOC, pilots were often forced to overfly their targets to confirm the aim-point, which increased their exposure in the combat zone. Second, many combat units, lacking BDA reporting from the CAOC, resorted to independent assessments. Although this did allow units to quality control the

²⁴³ Ibid. .

²⁴⁴ Ibid.

²⁴⁵ BACS, 6-4.

²⁴⁶ Ibid.

²⁴⁷ BACS, 9-6.

aim-point assignments²⁴⁸, it also ran the risk of spreading imprecise and possibly contradictory BDA within AIRSOUTH's subordinate units. The lack of assessment information also led to munitions effects assessment problems. The 31st Fighter Wing, for example, was not able to determine why their F-16s were dropping their GBU-10s short.²⁴⁹ With little time and information to work out the problem, wing planners replaced all GBU-10 ordnance loads with the GBU-12, a more accurate but much less powerful weapon.²⁵⁰

Inadequate combat assessment can be traced to three sources: lack of formal BDA training, vague measures of merit, and the inability of national collection assets to keep pace with the operational tempo. Internally, the BDA cell suffered from a lack of experienced personnel caused by a void in formal BDA training in NATO.²⁵¹ NATO's targeting school focused on target and weapons selection while providing only a basic understanding of BDA.²⁵² Efforts to bypass the cause by providing organic BDA training were ineffectual due to the rapid augmentee turnover rate, lack of automated systems, and few opportunities to practice. Consequently, the CAOC was fighting a losing battle to maintain a credible assessment capability.

The lack of useful criteria to judge the targeting cycle also impeded BDA efforts. Many BDA analysts during DELIBERATE FORCE claimed the lack of detailed campaign objectives short-circuited the assessment process, forcing BDA to focus on "lower tier" evaluations (destruction) to the exclusion of the "higher tier" (functional effects).²⁵³ The 32 AOG claimed in its final report that the failed BDA process was "partially attributable" to a lack of detailed campaign objectives.²⁵⁴ Unable to determine the air campaign's true intent, the BDA Cell defaulted to relatively meaningless measures

²⁴⁸ BACS, 9-6.

²⁴⁹ BACS, 8-62

²⁵⁰. Ibid. The GBU-10 (Guided Bomb Unit) is a 2000-pound laser guided bomb while the GBU-12 is a 500-pound weapon. Although more accurate, its reduced destructive capability could require multiple passes to achieve the effects of a single GBU-10, thus increasing the exposure and risk to the pilots.

²⁵¹ BACS, 6-2.

²⁵² Ibid.

²⁵³ BACS, 6-4.

²⁵⁴ Ibid.

of merit.²⁵⁵ Consequently, COMAIRSOUTH and other senior leaders relied on their own BDA criteria: (1) individual aim-points—moderate, severe damage, or destroyed, and (2) target with multiple aim-points—two-thirds of the aim-points destroyed.²⁵⁶ Ultimately, General Ryan maintained his own BDA logbook and personally approved each target assessment.

Combat assessment also suffered from the inability to synchronize national support systems with the operational rhythm of the conflict. Although national support agencies were devoting enormous collection resources to the execution of DELIBERATE FORCE, the tasking process of these systems was not doctrinally postured to support short-notice requirements from the theater. After the campaign, Colonel Zeorb related that a “...lack of timeliness and coherence on the part of national support agencies [was a] significant limitation in this regard.”²⁵⁷ This left BDA analysts without timely access to overhead imagery on several retasked targets, thus degrading their ability to perform adequate BDA.

Summary

In spite of the ambiguous geo-political landscape, DELIBERATE FORCE made a major contribution to the UN’s overall peace effort in Bosnia-Herzegovina. Although judged by most as a successful military campaign, DELIBERATE FORCE also offers insight into some of the problems that confront joint targeting in limited theater war. Foremost is the difficulty in defining what joint targeting is intended to accomplish to support the overall campaign. Failure on the part of the UN and NATO to align the military objective with the desired political end-state led to a targeting strategy that was optimized to degrade Bosnian Serb Army capabilities and protect the safe areas, but measured on its ability to coerce a broader settlement. In the end, the targeting effort did help coerce the Serbs to the negotiating table, but the success was one of uncomfortably narrow margins.

Bridge attacks in Bosnia also illustrate problems that relate to objective determination. Initially pursued in support of the NATO’s military objective, Bosnian

²⁵⁵ BACS, 6-3.

²⁵⁶ BACS, 8-45.

bridges were later targeted to funnel retreating Bosnian Serb Army heavy weapons into predictable avenues to facilitate UN accounting responsibilities. Failure to emphasize the primacy of the objective during target development allowed the joint targeting process to chase a target set that clearly exceeded NATO's assigned responsibility. Finally, shortfalls in BDA expertise, ineffective measures of merit, and relatively unresponsive imagery support by national agencies caused ineffectual BDA reporting and led to COMAIRSOUTH's decision to establish personal BDA criteria.

²⁵⁷ BACS, 6-6, see footnote 21



CHAPTER 5

JOINT TARGETING IN SMALL SCALE CONTINGENCY OPERATIONS: *MESSAGE IN A MISSILE*

By keeping a lid on all the designated targets, I knew I could keep control of the war in my own hands.

—President Lyndon B. Johnson

In the late evening darkness of 2 September 1996, two B-52s loaded with conventional air-launched cruise missiles (CALCMs) lifted off from Andersen Air Force Base in Guam enroute to the longest wartime bombing sortie in US history. The bombers flew a grueling 34-hour/16,000 mile round-trip mission and, in conjunction with elements of NAVCENT's Task Force 50 (TF-50), fired 13 missiles in support of Operation DESERT STRIKE.²⁵⁸ The third in a series of contingency airstrikes against Iraq following the Gulf War, DESERT STRIKE was launched in response to Iraqi aggression against Kurdish factions near the northern town of Irbil.²⁵⁹ For two days, Iraqi air defense systems stood in the crosshairs of this unilateral missile attack, which was aimed at sending the “message” to Saddam Hussein that “when you abuse your people or threaten your neighbors you must pay a price.”²⁶⁰ The airstrikes were a short precursor to a larger force build-up in the Persian Gulf designed to bolster US resolve in the region. Facing a growing Coalition threat on its southern flank, Baghdad eventually relented to US pressure and terminated its assault on the Kurds, which effectively ended the crisis.

²⁵⁸ “B-52s lead attack on Iraq,” *Air Force News Service*, 12 September 1996, n.p.; online, Internet, 9 March 1999, available from <http://www.af.mil/news/index.html>. TF-50 included the Laboon (DDG 58), the Shiloh (CG 67), the Russell (DDG 59), and Hewitt (DD 966), all of which employed TLAMs during the two-day operation.

²⁵⁹ The Patriotic Union of Kurdistan (PUK) held the town of Irbil while the Kurdistan Democratic Party (KDP), with support from the Iraqi Army, were attempting to capture it.

²⁶⁰ The White House, “Statement by the President,” *Air Force Link*, 26 September 1996, n.p. online, Internet, 12 January 1999, available from <http://www.af.mil/current/dstrike/>.

JOINT TARGETING DURING DESERT STRIKE

In response to Iraqi troop build-ups along the border of the northern no-fly zone in mid-August, CENTCOM/J-3 (Operations) began considering the military options at its disposal.²⁶¹ Based on somewhat sketchy guidance from the NCA, J-3 planners compiled a list of possible targets that included key Iraqi leadership, command and control, and IADS aim-points.²⁶² Making the assumption that assets flying from bases in Turkey and Saudi Arabia in support of Operations NORTHERN WATCH and SOUTHERN WATCH would not be available for the proposed operation, CENTCOM's plan was initially conceived as a TLAM-only airstrike.²⁶³ Within a few days, CENTCOM had developed a plan that was ready for NCA review.

On 31 August, Iraqi ground forces pounded their way into northern Iraq and attacked Kurdish factions in direct violation of UN resolutions.²⁶⁴ On 1 September, the Secretary of Defense, the Vice-Chairman of the Joint Chiefs of Staff (VCJCS), and other high-ranking officials convened at the Pentagon to review CENTCOM's plan and discuss other military options.²⁶⁵ During the meeting, a different list of targets emerged that had been developed by the National Security Council (NSC) and endorsed by the NCA.²⁶⁶ The Secretary directed CENTCOM to re-plan the contingency operation using this new

²⁶¹ Capt Jamie Navarro, JCS/J-2T, Pentagon, Washington D.C., interview with author, 15 January 1999. , Capt Navarro was a member of CENTCOM/J-2 and participated in the initial planning efforts (in mid-August) for DESERT STRIKE.

²⁶² Ibid.

²⁶³ Ibid.

²⁶⁴ This Iraqi military action violated UN Security Council Resolution (UNSCR) 688, which prohibits repression of disenfranchised Kurds in northern Iraq and the March Arabs in southern Iraq. This action also impeded UNSCR 986, which was a humanitarian relief effort under the auspices of the "food for oil" program. Irbil was a major distribution center for this humanitarian aid.

²⁶⁵ The Chairman of the Joint Chiefs of Staff (CJCS) and CINCCENT were in CENTCOM's area of responsibility (AOR) during this operation. In the absence of the CJCS, the VCJCS assumed the duties of principal military advisor to the NCA for the duration of DESERT STRIKE.

²⁶⁶ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999. Commander Baxter was appointed by the VCJCS to conduct an in-depth study of DESERT STRIKE. In his analysis of the operation, Commander Baxter discovered that the National Security Council had selected the targets that ultimately were attacked during DESERT STRIKE.

list of targets, which focused solely on IADS south of the 33rd parallel (see Diagram 1).²⁶⁷ When military leaders tried to voice their reservations regarding the NSC's target list, the Secretary adamantly replied: "You're not listening, IADS south of the 33rd."²⁶⁸ In addition to the target list, the NCA also directed the exclusive use of CALCMs and TLAMs for the attack and called on CENTCOM to execute the operation within 24 hours.²⁶⁹ Citing serious planning and force-posturing concerns, the VCJCS obtained a 24-hour delay in execution, allowing CENTCOM to establish a more achievable H-Hour.

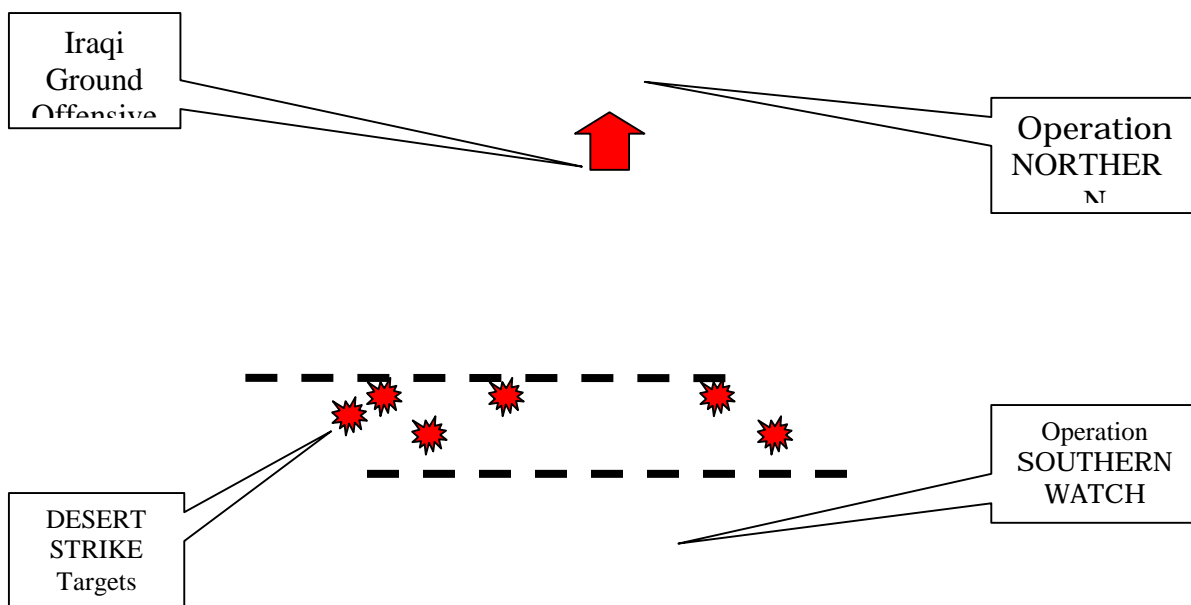


Diagram 1. Iraqi No-fly Zones

²⁶⁷ Ibid.

²⁶⁸ Ibid., Lt Col Minster was a member of the JCS/J-2T and was present in the meeting between the Secretary of Defense, the VCJCS, and other military leaders on 1 September 1996. Colonel Minster does not recall a specific strategy or objective that was discussed during the meeting, nor does he recall hearing the Secretary state an explanation for the targeting decision.

²⁶⁹ Ibid.

Because few aim-points on the NSC's target list had been planned in advance by CENTCOM, the J-3 targeting process essentially had to start from scratch.²⁷⁰ A number of the new targets were lacking in current imagery and others lacked mensurated coordinates²⁷¹—an absolute necessity when employing standoff munitions such as TLAM and CALCM.²⁷² Working under a very tight deadline over a national holiday weekend (Labor Day), CENTCOM was hard pressed to complete the plan prior to execution. A constant influx of target “adjustments” from the NSC over the ensuing two days presented addition challenges for CENTCOM's targeting efforts and further consumed precious planning time.²⁷³

Agencies supporting CENTCOM's targeting process also struggled to meet the rigorous time schedule. For example, US Atlantic Command's Cruise Missile Support Activity (CMSA), the organization responsible for all TLAM mission planning for DESERT STRIKE, completed TLAM mission planning for the initial strike only hours before launch time.²⁷⁴ CALCM planners at the 408th Air Operations Group (AOG) also

²⁷⁰ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999. During his investigation, Cdr Baxter hosted a conference in San Diego, CA, that was attended by almost every military organization involved with the planning or execution of DESERT STRIKE. In his notes from the investigation, Cdr Baxter observed that though CENTCOM had originally planned a number of targets to support DESERT STRIKE, the NSC did not consult with CENTCOM during target selection, and as a result, virtually every target on the NSC's target list had not been pre-planned by CENTCOM. In order to satisfy the comprehensive planning requirements of cruise missile employment, CENTCOM moved quickly to gather the necessary targeting information and conduct an analysis of the target—all of which took time.

²⁷¹ Mensurating an aim-point is an exhaustive process of using overhead imagery and other mapping materials to determine the precise coordinates of a particular target. The level of detail required to achieve such accuracy often consumes large amounts of time but is currently the most accurate means of determining the coordinates of a target.

²⁷² Maj David Belcher, United States Atlantic Command Cruise Missile Support Activity (USACOM CMSA), telephonic interview with author, 15 March 1999. Maj Belcher was a TLAM planner at CMSA during DESERT STRIKE.

²⁷³ Robert Cochran, CENTCOM/J-2, telephonic interview with author 16 March 1999.

²⁷⁴ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999.

Commander Baxter related that four of the TLAM missions launched on the first day were not made available to TF-50 until approximately eight hours prior to H-Hour.

experienced problems with the time limitations.²⁷⁵ In fact, CALCM mission planning was not completed until after the B-52s had left Guam and were enroute to their launch

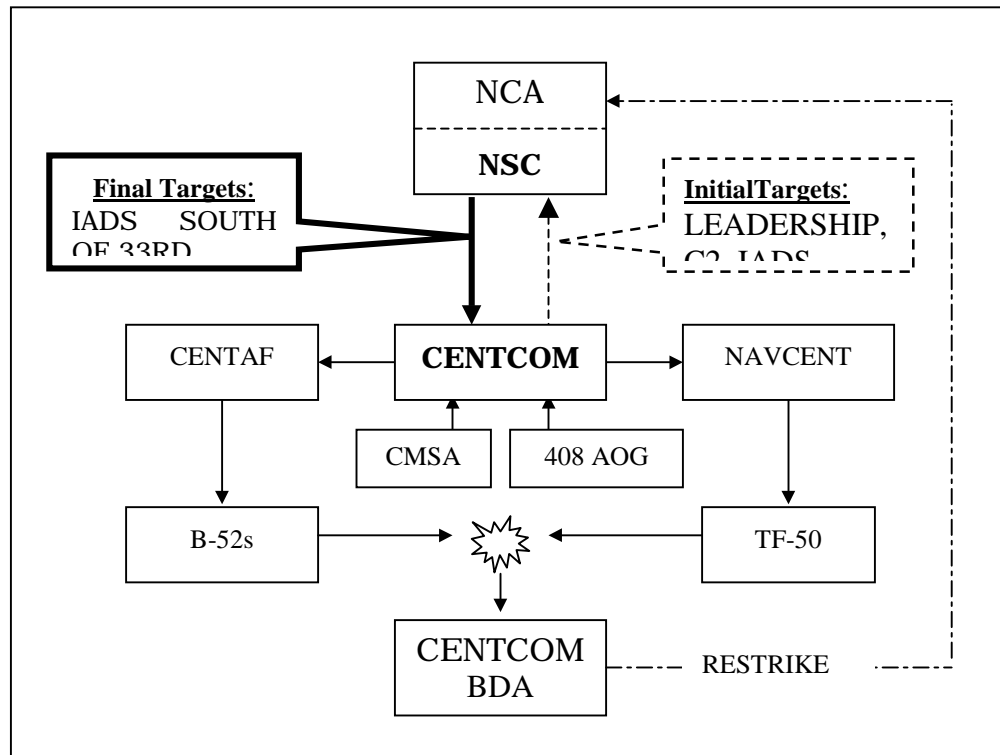


Figure 6. Joint targeting during DESERT STRIKE

points, forcing CENTCOM to effect target changes directly with the aircrews over the radio.²⁷⁶

Following the initial airstrike on 3 September, CENTCOM BDA assessments indicated that four of the targets had not received the desired level of damage. The NCA quickly ordered CENTCOM to launch a second volley of missiles on 4 September against the remaining targets, this time using only TLAMs in the attack. Post-strike assessment confirmed that the re-strike had completed the task, thus allowing CENTCOM to assume

²⁷⁵ Ibid.

²⁷⁶ Ibid.

Operation SOUTHERN WATCH responsibilities up to the 33rd parallel and signaling the end of DESERT STRIKE.

What did joint targeting accomplish?

To gain insight into the true merits of the joint targeting process during DESERT STRIKE, one must compare the objectives of the operation with the actual results. Immediately following the initial salvo of cruise missiles on 3 September, President Clinton explained the purpose of DESERT STRIKE:

“Our objectives are limited, but clear: to make Saddam pay a price for the latest act of brutality, reducing his ability to threaten his neighbors and America’s interests. First we are extending the no-fly zone in southern Iraq. This will deny Saddam control of Iraqi air space from the Kuwaiti border to the southern suburbs of Baghdad, and significantly restrict Iraq’s ability to conduct offensive operations in the region. Second, to protect the safety of our aircraft enforcing this no-fly zone, our cruise missiles struck Saddam’s air defense capabilities in southern Iraq.”²⁷⁷

From the political perspective, the objective of DESERT STRIKE was to impose a stiff penalty on Saddam Hussein that would undermine his ability to conduct regional aggression. In this case, the NCA also sought to further reduce Iraq’s useable airspace, which would eliminate an important joint training area for Iraqi military forces as well as provide an increased buffer to aggression in southern Iraq.²⁷⁸ Militarily, the aim of DESERT STRIKE was to destroy Iraqi IADS south of the 33rd parallel to enable the safe expansion of the southern no-fly zone.

²⁷⁷ The White House, “Statement by the President,” *Air Force Link*, 26 September 1996, n.p.; online, Internet, 12 January 1999, available from <http://www.af.mil/current/dstrike/>.

²⁷⁸ “Secretary of Defense William J. Perry DOD News Briefing,” *Federation of American Scientists*, 3 September 1996, n.p.; on-line, Internet, 12 January 1999, available from http://www.fas.org/man/dod-101/ops/desert_strike.htm. The VCJCS further clarified the President’s statement during this DOD briefing: “There is a major military training area within that zone as well as two major air bases with airplanes. By Denying this airspace to the Iraqi regime, we have given ourselves more warning, should be decide to move south against our friends and allies. We have also made a significant impact on his ability to train. The denial of that training area effectively denies him the ability to train his ground forces with their air force.”

From the political standpoint, US policy-makers were pleased with the targeting results in DESERT STRIKE. On 4 September, the President summed up the US viewpoint: "...I'm satisfied that this mission has achieved the objectives we set out for it, and our defense advisors from the Secretary of Defense to General Sahlikashvili to our commander in the area all believe that we did what was necessary and they feel good about where we are now."²⁷⁹

A close look at the military results, however, portrays a less appealing outcome. Of the 18 targets on the final targeting list, 15 were actually attacked.²⁸⁰ 13 CALCMs and 14 TLAMs were employed during the initial volley while 17 additional TLAMs were launched the second day for a total of 44 cruise missiles.²⁸¹ Though the actual hit percentages and specific target BDA remain classified, the fact that a second "mop-up" strike had to be conducted on four of the 15 targets does suggest some initial results were marginal.²⁸² Two weeks after DESERT STRIKE, the Secretary of Defense acknowledged that "...Iraq had rebuilt its air defense units and fired six missiles at US warplanes since US missile strikes against Iraq in early September."²⁸³ This evidence appears to indicate that joint targeting was successful in achieving only ephemeral effects on the Iraqi IADS when clearly the Clinton Administration was seeking a more lasting solution. While in the political sense, a "message" was sent to the Iraqi leader, militarily the airspace south of the 33rd parallel was no less hostile than it had been before the strike, thus drawing into question the overall success of the joint targeting process.

²⁷⁹ "Full Text of Clinton's Speech," *Associated Press*, 4 September 1996, n.p.; on-line, Internet, 14 December 1998, available from <http://www.usatoday.com/news/index/iraq/nirginde.html>.

²⁸⁰ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999. Although 18 targets were originally selected by the NSC, 15 targets appeared in the Execute Order, which were subsequently attacked during DESERT STRIKE. It is unclear why the target list was shortened prior to execution.

²⁸¹ "Secretary of Defense William J. Perry DOD News Briefing," *Federation of American Scientists*, 4 September 1996, n.p.; on-line, Internet, 12 January 1999, available from http://www.fas.org/man/dod-101/ops/desert_strike.htm.

²⁸² *Ibid.* The second strike was not premeditated in the Execution Order, but was deemed necessary following the evaluation of the initial strike.

²⁸³ "Perry seeks anti-Iraq alliance but doubts grow," *Associated Press*, 19 September 1996, n.p.; on-line, Internet, 14 December 1998, available from <http://www.usatoday.com/new/index/iraq/nirginde.html>.

Joint Targeting Deficiencies

The joint targeting process suffered three major departures from the scientific problem-solving methodology during DESERT STRIKE.

Issue #1: *DEFINING THE PROBLEM:* *The military purpose of DESERT STRIKE was not clearly understood, which led to targeting solutions that dampened the overall effectiveness of the joint targeting process.*

From the President's speech on 3 September, one might conclude that the stated objectives for DESERT STRIKE clearly directed both the planning and execution of the operation. Despite this impression, however, evidence suggests that there was a general lack of understanding regarding the purpose of DESERT STRIKE throughout the operation. From the outset of CENTCOM's planning efforts in mid-August, very little in the way of detailed guidance was articulated. There is nothing to indicate that a Warning Order, Planning Order, or Alert Order was published for DESERT STRIKE, which could have clarified the purpose of DESERT STRIKE.²⁸⁴ Although an Execute Order was issued for the operation, it made no mention of any objectives or underlying purpose for the operation but merely included the list of targets to be struck.²⁸⁵ CENTCOM planning, instead, was guided by "broad and vague" instructions to "send a message" to the Iraqi regime.²⁸⁶ Without the benefit of a stated objective, targeting activities generally lacked a sense of direction and became prone to individual preferences, sometimes to the neglect of prudent operational judgement.²⁸⁷

²⁸⁴ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999. During his JCS-sanctioned investigation of DESERT STRIKE, Cdr Baxter found no evidence of a published Warning Order, Planning Order, or an Alert Order.

²⁸⁵ According to Armed Forces Staff College Pub 1: "In the no-prior-warning response situation where a crisis event or incident requires an immediate response without any prior formal planning, the Execute Order must convey all essential guidance that would normally be issued in the Warning Order, Planning Order, and Alert Order." See N-2. The Execute Order for DESERT STRIKE included few instructions beyond the actual target list for the operation. Effectively, the target list was the objective for DESERT STRIKE.

²⁸⁶ Robert Cochran, US CENTCOM/J-2, telephonic interview with author, 15 March 1999.

²⁸⁷ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999. Commander Baxter related that certain individuals within the NSC selected

The lack of a clear military purpose for DESERT STRIKE led to two notable problems for the targeting process. First, the target development process was essentially preempted by an abstract targeting strategy. The specific IADS targets that appeared on the NSC's targeting list for DESERT STRIKE were all selected based on their geographic location relative to the 33rd parallel. The NSC reasoned that suppressing these threats would enable the safe expansion of the southern no-fly zone. However, in order to properly secure the safety of the aircrew in that area, every air defense system capable of influencing the disputed airspace needed to be targeted, not simply those systems physically residing within the territorial boundaries of the no-fly zone. Several SAM sites, in fact, were positioned just north of the 33rd parallel whose missiles had easy access to a significant portion of the new no-fly zone.²⁸⁸ The Iraqi IADS, in other words, had to be targeted functionally, not geographically. Without a clear understanding of what DESERT STRIKE was intended to achieve, the NSC chose a targeting strategy that ignored hostile air defense threats just north of the 33rd parallel, leaving large sections of the new no-fly zone still exposed to some very capable threats.²⁸⁹

Second, the lack of clear objectives left weapon assignment efforts in a quandary. Weapons planners at CENTCOM were uncertain as to what effect the targeting strategy was intended to have on the Iraqi IADS. Although the type of weapon had already been directed by the NCA (i.e. cruise missiles), there was no guidance to help them determine the number of weapons each target would require to create the desired effect.²⁹⁰ With nothing more than a target list guiding its efforts and planning time running out, CENTCOM eventually decided to use 0.7 P_D as the damage probability standard for

the targets based on their own personal judgments without fully understanding what was required to accomplish the objective.

²⁸⁸ Lt Col David Minster, telephonic interview with author, 7 March 1999.

²⁸⁹ "Presidential remarks on Iraq at Lunch meeting," *Associated Press*, 5 September 1996, n.p.; on-line, Internet, 9 March 1999, available from <http://whitehouse.gov/white-house-publications/1996/09>. During this news conference, the President acknowledge that air defense sites north of the 33rd parallel had electronically locked on to aircraft patrolling the southern no-fly area just hours after the resumption of Operation SOUTHERN WATCH.

²⁹⁰ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999.

every target.²⁹¹ However, BDA reports from the initial airstrike indicated that 0.7 P_D did not produce the desired level of damage for at least two targets, forcing CENTCOM to re-visit these same targets the following day.²⁹² Had CENTCOM been privy to a clear set of objectives, weapon assignment procedures could have been tailored to meet the needs of the operation more effectively.

The reason that target development and weapon assignment activities were less than optimal in DESERT STRIKE can be traced to the NSC's involvement in the targeting process. First, the NSC did not comprehend the full implications of the military objective. Target selections were based on geographic locations of the SAM threats in the new no-fly zone when clearly a functional approach towards the Iraqi IADS was required. Consequently, the joint targeting process fell short of achieving its goal of securing the safety of Coalition pilots patrolling the new no-fly zone. Second, the NSC failed to effectively communicate (through the NCA) the military purpose of the operation to CENTCOM. The only published instructions that were issued to CENTCOM during DESERT STRIKE did not resemble the traditional format (i.e. some type of objectives and/or guidance), but rather, were in the form of a targeting list developed by the NSC. In essence, this target list *was* the objective for DESERT STRIKE. Target selection and weaponeering, however, should be the product of clear objectives—not a replacement. With the NSC's target list providing the sole impetus for DESERT STRIKE, CENTCOM's targeting process was effectively severed from its intellectual foundation (objectives and guidance). Admittedly, it is counter-factual to contend that targeting the Iraqi IADS would have achieved greater success had clear military objective been the catalyst for the joint targeting process. However, regardless of whether the results of the joint targeting process would have improved, one thing is certain: target development and weapons assignments would have had the benefit of a rational selection process.

Issue #2: GATHERING SUFFICIENT DATA: The joint targeting process failed to collect and analyze enough information to confirm the validity of some IADS targets.

²⁹¹ Lt Col David Minster, telephonic interview with author, 7 March 1999.

²⁹² Ibid.

Despite extraordinary efforts on the part of CENTCOM planners, some target development problems occurred during DESERT STRIKE that affected the results of the joint targeting process. During the initial stages of planning in mid-August, CENTCOM encountered few problems compiling a list of targets. CENTCOM had long been tracking a variety of potential Iraqi aim-points and had at its disposal all the required information to plan an attack including target status, detailed coordinates, and current imagery. Many of the targets, in fact, had already been assigned a TLAM mission from previous planning efforts. USACOM CMSA, who was maintaining continuous contact with CENTCOM during the initial planning process, was advised “their stuff was taken care of;” meaning that TLAM mission planning was on schedule.²⁹³ On 1 September, the situation changed radically for CENTCOM.

With a 48-hour suspense clinging to the brand new target list, CENTCOM’s joint targeting process was thrown into overdrive. Planners worked around the clock to complete targeting solutions to satisfy NCA directives. Target development focused on selecting appropriate aim-points for the fixed surface-to-air sites and air defense command and control facilities between the 32nd and 33rd parallel. Many of the targets, however, lacked essential targeting information. IMINT products had to be special ordered, which caused uncomfortable delays in the process.²⁹⁴ Mensurating the new target coordinates proved to be a very lengthy process as well, which further consumed CENTCOM’s precious planning time.²⁹⁵ A continuous influx of target “modifications” from the NSC also beset planning efforts and further depleted available planning time.²⁹⁶ Consequently, planners were still validating aim-points and making weapons decisions right up to launch time, as illustrated by the in-flight retasking of the CALCMs.

²⁹³ Maj David Belcher, USACOM CMSA, Norfolk Naval Base, telephonic interview with author, 15 March 1999. Maj Belcher was a TLAM planner at CMSA during DESERT STRIKE.

²⁹⁴ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999.

²⁹⁵ Ibid.

²⁹⁶ Ibid. According to Cdr Baxter, most of these changes came directly from the NSC.

Of particular note during DESERT STRIKE was the unprecedented use of standoff munitions against moveable targets (radars, SAM sites).²⁹⁷ This employment technique however, was driven more by NCA direction and convenience than by prudent military judgement.²⁹⁸ Because of their high cost and relatively low weapons yield, cruise missile employment prior to DESERT STRIKE was generally restricted to fixed, high-value targets. During DESERT STRIKE, TLAMs and CALCMs were used to target individual radars and other essential equipment associated with a “fixed” SAM site—most of which could be moved around to other areas within the SAM site. This presented a unique challenge for the planners, who had to monitor the status of each aim-point continuously using the latest overhead imagery to reconfirm the target locations. When discrepancies between the actual target location and the planned aim-point were revealed by overhead imagery, planners from CMSA and the 408th AOG attempted to coordinate a new aim-point with CENTCOM via telephone. However, this process proved inadequate and led to some unsatisfactory cruise missile employment results.²⁹⁹

DESERT STRIKE suffered from at least three targeting deficiencies involving insufficient data collection that reduced the overall effectiveness of the airstrike. First, an Iraqi IADS sector operations center (SOC) was attacked during the raid that was in all likelihood not an active facility at the time. According to a former JCS/J-2T targeting officer familiar with this specific target, there was no IMINT, SIGINT, or ELINT intelligence information indicating the site was active.³⁰⁰ In fact, imagery of the target displayed a huge gapping hole in the roof of the building from a previous attack during

²⁹⁷ A moveable target refers to something that can, with some effort, be moved. Typically, moveable equipment requires a tear-down and a build-up and is generally considered non-operational during transition. This is in contrast to a mobile target, which can be readily repositioned anywhere on the battlefield and can normally perform its intended function while in transit.

²⁹⁸ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999. According to Cdr Baxter, the NCA, citing collateral damage concerns and wishing to minimize risk to military personnel, directed the use of TLAM and CALCM for all targets.

²⁹⁹ Maj Bruce Belcher, United States Atlantic Command Cruise Missile Support Activity (USACOM CMSA, Norfolk Naval Base), telephonic interview with author, 15 March 1999. Maj Belcher was a TLAM planner at CMSA during DESERT STRIKE.

³⁰⁰ Lt Col David Minster, telephonic interview with author, 7 March 1999

the Gulf War.³⁰¹ Although CENTCOM did have access to this information, for unknown reasons it did not act on it.

In another incident, a TLAM missed its intended target because the Iraqis had moved it from the planned aim-point. In this case, CMSA was unable to convey to CENTCOM that the target had been moved away from the planned aim-point. Although both CENTCOM and CMSA had the latest imagery of the target, CENTCOM thought the planned aim-point matched the latest image, while in reality the aim-point CMSA had planned was for the target's previous location.³⁰² In a third instance, faulty target analysis possibly led to the selection of the wrong aim-point. At one particular early warning (EW) radar site, two radars were present; one was real, one was a decoy. The cruise missile targeted against the site destroyed the decoy radar and failed to damage the real target.³⁰³

Three factors appeared to cause these targeting problems: communications, procedures, and time. Communication breakdowns between CENTCOM and JCS/J-2T led to a least one targeting deviation. J-2T, acting in its advisory role, recommended to CENTCOM that the SOC be removed from the list since the target was already inactive.³⁰⁴ For unknown reasons, this information was never received by CENTCOM decision-makers. Communication problems also led to a cruise missile attack on an empty earthen-berm. Because of crossed signals regarding the aim-point selections for TLAM, CMSA could not convince CENTCOM that the aim-point they had planned was vacant and the new aim-point had to be reprogrammed into the missile.

Procedurally, there was no individual responsible for coordinating aim-points between the planners at CMSA and CENTCOM. Cruise missiles had traditionally been planned against "fixed" sites, which required no special massaging at the regional command. Normal operations procedure for CMSA was to receive target tasking from the regional command, plan the TLAM mission, and forward the results to the theater for execution.

³⁰¹ Ibid.

³⁰² Maj David Belcher, telephonic interview with author, 15 March 1999.

³⁰³ Lt Col David Minster, telephonic interview with author, 7 March 1999

After the missions had been received by TF-50, CMSA observed imagery that the Iraqis had moved one of the targets. However, no formal procedures existed to effect this type of short-notice change since TLAM target sets had traditionally been “fixed.”³⁰⁵ With only an ad-hoc process available (telephonic discussions), CMSA was unable to prevent the targeting mistake.

Finally, there is little doubt that the tight time constraints in this operation were, in some way, responsible for the targeting miscues. Though 44 missiles and 15 targets may seem small by DESERT STORM standards, it required a maximum effort by many planners to conduct the operation. No place is the lack of time better illustrated than by the retasking of the B-52s in-flight. Last-minute target changes due to insufficient planning time were rectified only by extraordinary efforts on the part of the B-52 aircrew, who cleverly overcame some seemingly impossible challenges.³⁰⁶ Although the exact BDA results remain classified, it is highly likely that had more time been allocated for planning, the results would have been better.

Issue #3: FORMULATE POSSIBLE SOLUTIONS: The joint targeting process did not optimize the weapon solutions for DESERT STRIKE.

Weapon selection during DESERT STRIKE was specifically directed by the NCA.³⁰⁷ Citing collateral damage concerns, the desire to minimize risk to American lives, and wishing to preserve the element of surprise, the NCA decided to constrain weapons employment to standoff munitions.³⁰⁸ Consequently, CALCM and TLAM became the “weapons of choice” for DESERT STRIKE.

Given the cruise missile mandate from the NCA, weaponeering was still not optimized for the target set. In one case, a TLAM was targeted against a super-hardened structure

³⁰⁴ Lt Col David Minster, telephonic interview with author, 7 March 1999. Lt Col Minster was the action officer in the JCCS/J-2T that highlighted the potential discrepancy and talked with CENTCOM planners regarding it.

³⁰⁵ Maj Bruce Belcher, telephonic interview with author, 15 March 1999.

³⁰⁶ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999. Though the details of this event remain classified, it is sufficient to say that the B-52 aircrew were instrumental in ensuring the CALCMs reached their intended destination.

³⁰⁷ Ibid.

that clearly exceeded the weapon's design capabilities.³⁰⁹ Likewise, CALCM was assigned a number of "hard" facilities that were outside the capabilities of the weapon, but could have been serviced successfully by TLAM.³¹⁰ Though the details of the cruise missile mix-up can not be divulged here, suffice it to say that few issues drew more unanimous condemnation in the wake of DESERT STRIKE than the misallocation of CALCMs and TLAMs.³¹¹

There were two distinct but similar causes for the weaponeering mistakes that occurred during DESERT STRIKE: (1) lack of cruise missile expertise at the appropriate planning level, and (2) lack of coordination between CMSA and the 408th Air Operations Group. Whether it was the NSC or CENTCOM that made the ultimate TLAM and CALCM weaponeering decisions, cruise missiles were not optimally employed during DESERT STRIKE. Many of the aim-points that were considered "hardened" targets were actually attacked by CALCMs when clearly the more capable weapon in this regard was the TLAM.³¹² Likewise, TLAMs targeted some of the "soft" targets when the CALCM, with its higher yield, may have been a better choice.³¹³ Because neither the NSC nor CENTCOM had the benefit of cruise missile expertise during the weapons allocation process, the unique capabilities and limitations of each weapon went largely unnoticed.³¹⁴ If expert cruise missile planners had been available at the appropriate planning level, this problem might well have been averted.

Once weaponeering decisions had been made, the specific targets were then farmed out to CMSA and the 408th AOG for detailed planning. However, both CMSA

³⁰⁸ Ibid.

³⁰⁹ Lt Col David Minster, telephonic interview with author, 7 March 1999. For classification reasons, exact weapons capabilities and performance can not be discussed here.

³¹⁰ Lt Col David Minster, telephonic interview with author, 7 March 1999. Comparatively speaking, TLAM has a much more robust "hard" target capability than the CALCM.

³¹¹ Maj Bruce Belcher, USACOM CMSA, Norfolk Naval Base, telephonic interview with author, 15 March 1999.

³¹² Ibid.

³¹³ Ibid.

³¹⁴ Ibid.

and the 408th AOG pursued their planning efforts in isolation of one another.³¹⁵ Had these two organizations established an effective liaison, the misallocation problem would have become obvious. In sum, aim-point and weapons pairings were made without the full benefit of professional cruise missile planners, who were themselves pursuing independent solutions without the benefit of cross talk.

Summary

Although DESERT STRIKE was a relatively small military operation in comparison to the preceding case studies, it nevertheless renders valuable insight into the problems that currently impede the joint targeting process. First, DESERT STRIKE provides a unique glimpse of the difficulties in translating political intentions into appropriate targeting results. Whereas target nominations during both DESERT STORM and DELIBERATE FORCE were generally made by military personnel and approved by the political leadership, DESERT STRIKE witnessed target and weapon selections made directly by US policy-makers. Although not unprecedented, the selection of targets and weapons by the NSC was certainly unusual and effectively bypassed the most essential step in the joint target process—objective and guidance determination.

Second, target development suffered a lack of sufficient information to validate some of the targets. Notwithstanding the severe time constraints and the NSC's frequent target "modifications", there were communication and procedural failures that led to targeting problems which might have been avoidable. In particular, miscommunication between CENTCOM and its advisory agencies and planning subcontractors highlight two instances where deference vice confrontation may have averted a miscue. Finally, in spite of the NCA-directed use of TLAM and CALCM, weaponeering in DESERT STRIKE was not optimized for the target list. The distinct lack of cruise missile expertise at the appropriate planning level and the failure of CMSA and the 408th AOG to establish a communications link led to weapons employment that did not effectively account for the unique characteristics of TLAM and CALCM.

³¹⁵ Cdr Kevin Baxter, JCS/J-8 Strike Assessment, telephonic interview with author, 15 March 1999.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

There are no easy solutions to the targeting problems of today; nor will the problems of the future be easier to resolve.

—Air Force Pamphlet 200-17
11 October 1978

One of the most compelling themes characterizing US military operations in the post World War II era has been the use of and reliance on overwhelming military strength. Galvanized by the downfall of the Soviet military threat and the stunning victory in the Gulf War, America now seems to accept superior military strength as fact. Given the current trend towards a leaner force structure, however, the US armed forces are becoming ever dependent upon precision munitions as a means to guarantee superior military strength in future conflict. Heavy reliance on such sophisticated weaponry as the joint direct attack munitions (JDAM), TLAM, CALCM, and the AGM-130 during the recent crisis in Kosovo helps illustrate the present trend.³¹⁶ Yet, as accurate as these and other "smart" weapon systems have become, without the benefit of a "smart" targeting process to identify the proper enemy aim-points, their tremendous advantages in war can quickly become irrelevant. As the case studies in this thesis have demonstrated, serious deficiencies exist in the joint targeting process that threaten to negate the utility of America's sophisticated combat arsenal. If left uncorrected, these deficiencies promise to

³¹⁶ JDAM is a family of precision munitions that rely on Global Positioning System (GPS) guidance to locate and destroy targets. The AGM-130, on the other hand, is a rocket-assisted 2000-pound weapon that has a guidance package mounted in the bomb itself, which the aircrew manipulate through a data link to provide terminal guidance to the target.

jeopardize the overwhelming military advantage that has accompanied virtually every US military commander into battle for the past half century.

Based on the evidence presented in DESERT STORM, DELIBERATE FORCE, and DESERT STRIKE, three problems in the process of joint targeting degrade targeting effectiveness. This chapter will discuss each deficiency, highlight pertinent causes, and offer some recommendations.

FINDING #1: The inability to translate objectives and guidance into congruent targeting activities is a recurring deficiency within the joint targeting process

Each case study witnessed serious targeting problems that in some way related to ineffective objective and guidance determination. Ideally, political objectives and guidance drive the development of clear military objectives, which provide the impetus for rational targeting solutions that ultimately contribute to the desired end-state. The evidence strongly suggests, however, that this task is seldom accomplished successfully. DESERT STORM, for instance, illustrated how joint targeting activities can deviate from objectives and guidance even in the presence of congruent political and military aims. Attacks on the Iraqi infrastructure provided CENTAF with a very appealing means to reduce the effectiveness of Baghdad's war machine. However, targeting the Iraqi electrical power system and POL production capacity led to detrimental secondary effects on the Iraqi populace and national infrastructure that were not compatible with the policy guidance articulated by President Bush.

DELIBERATE FORCE, on the other hand, highlighted the targeting problems that can exist when the military objective is not fully aligned with the desired end-state. AIRSOUTH specifically designed the targeting strategy in DELIBERATE FORCE to accomplish the narrower military aim of protecting the UN-designated safe area. This strategy resulted in a finite list of “demonstration” and “initial follow-on” aim-points that were very limited in scope. During the operation, however, targeting effectiveness was ultimately measured against the broader goal of coercing the Bosnian Serb Army into a negotiated settlement. Without the fortuitous contributions of a concurrent Federation land campaign combined with economic and political isolation of the Bosnian Serb

forces, it is questionable whether the restrained targeting strategy in DELIBERATE FORCE would have had the endurance to achieve the desired end-state.

Finally, DESERT STRIKE, provides an example of how the joint targeting process can be led astray in the complete absence of objectives and guidance. Without a firm understanding of the military purpose for the operation, the planning and execution of DESERT STRIKE faltered on two accounts. First, the Iraqi IADS threat was targeted based on the geographical positions of the SAM sites vice a functional approach, which would have been more appropriate in light of the military objective. Second, the NSC's target list and the vague notion of sending a "message" provided insufficient targeting guidance to make weapons decision. Consequently, achieving the military objective was highly tenuous even before the first cruise missile left its launch platform.

Causes

(1) Lack of effective communication. To transform policy into appropriate targeting actions, there should exist a comprehensive understanding of the objectives and guidance throughout all levels of planning—from the policy-makers in Washington to the unit planners in the field. Effective communication between all planning echelons is an essential ingredient in this regard. Each case study witnessed communication failures that hampered the ability to translate objectives and guidance into targeting activities. In DESERT STORM for instance, CENTAF allowed some subordinate units to make their own aim-point selections. However, CENTAF planners did not adequately convey vital targeting guidance to these combat units to help ensure aim-point selections remained consistent with the policy restraints. As a result, some subordinate units selected aim-points that caused long-term Iraqi infrastructure damage, which was not congruent with the policy guidance.

Targeting problems during DELIBERATE FORCE also suffered from ineffectual communication. The chronic uncertainty over NATO's military objective in Bosnia during the two years leading up to DELIBERATE FORCE was the product of a distinct lack of communication between the UN and the North Atlantic Council. As a result, the UN's desired end-state and NATO's military objective for DELIBERATE FORCE were not adequately coordinated, which led to a targeting strategy with only tangential utility

in coercing the Bosnian Serb Army into negotiations. Finally, inadequate coordination during DESERT STRIKE led to a targeting strategy that was inconsistent with the objectives and guidance. Rather than providing traditional instructions to CENTCOM (i.e. objectives or guidance), the NSC provided guidance in the form of a target list that did not sufficiently portray all the information required for the mission. Accordingly, some targeting activities including weapons decisions were adversely affected by the lack of information.

(2) Failure to consider unintended targeting consequences. Targeting activities can also be placed at odds with objectives and guidance when planners do not adequately account for the possible targeting aftereffects. The undesirable consequences of targeting fall into two distinct categories: collateral damage and secondary effects. The subtle, yet clear, distinction between the two is that while the former occurs as a direct result of an attack and is instantaneous in its consequences, the latter is an indirect repercussion of an attack and generally has a more latent impact. Although collateral damage will likely remain an unpleasant reality of armed conflict, taking appropriate precautions during planning (i.e. proper selection of aim-points, weapons, and delivery platforms) can reduce the magnitude and scope of its effects, and thus keep targeting activities more aligned with policy guidance. DESERT STORM witnessed one of the most common sources of collateral damage in warfare: the use of non-precision weapons. In one such instance, for example, scores of JTF-PF assets attacked Iraq's Bayji refinery with unguided ordnance during the conflict. Though unintentional, these airstrikes destroyed several "cracking" towers, which was not congruent with the existing policy guidance.

Joint targeting in DESERT STORM was also guilty of causing undesirable secondary effects on the Iraqi infrastructure. By targeting the Iraqi electrical power system, CENTAF intended to accomplish very specific military objectives. However, what escaped the CENTAF planner's attention were the indirect and ruinous effects on other sectors of the Iraqi economy. Despite having "no quarrel with the Iraqi people," CENTAF targeting inflicted significant damage to Iraq's electrical power system, which led to a complete paralysis of the water and sewage treatment systems and possibly caused thousands of post-war non-combatant deaths.

(3) Primacy of the military objective. Targeting activities can also deviate from policy when military objectives are pursued without regard for the political guidance. During DESERT STORM for example, CENTAF deliberately targeted some refinery “cracking” towers as part of an overall effort to reduce Iraqi’s consumable POL by 70 percent. Although the policy guidance explicitly stated that Iraqi infrastructure damage was to be held to a minimum, CENTAF opted to target the towers to achieve its military objective.

Recommendation

Successfully translating objectives and guidance into compatible targeting activities is both extremely important and exceedingly difficult to achieve. It is apparent from the evidence that very few people, military or government, have the competence to perform this crucial task adequately. Although it is very unlikely that objectives and guidance determination will ever be error-free, there are, nevertheless, viable solutions that may help to improve the process. Education may be one way to attack this recurring joint targeting deficiency. Currently, the Joint Targeting School and the US Air Force Targeting School each offer formal instruction on effective methods of translating objectives and guidance into congruent targeting activities. However, the overwhelming majority of attendees at these targeting schools over the past several years have been intelligence personnel, while only a fraction have come from the operations community whose responsibility it is to perform objectives and guidance determination.³¹⁷ Increasing the enrollment of operations personnel at these formal targeting schools will not only expose more of the operations community to the joint targeting process, it will also provide the necessary cognitive skills that are desperately needed by operations planners

³¹⁷ Maj David L. Glasgow, Joint Targeting School, telephonic interview with author, 21 April 1999. According to Joint Targeting School records, 71 percent of the attendees at the school have an intelligence/targeting background while only 27 percent are operations personnel. Most of these operations planners, however, are from tactical units (i.e. US Army and US Marine Corps battalion fire support officers and non-commissioned officers). When the number of unit-level planners is subtracted out, the actual number of operations planners that enroll in these formal targeting schools is less than 10 percent. Operations personnel include, but are not limited to regional command J-3 / J-5 personnel, US Army Corps and Marine Expeditionary Force (MEF) G-3 / G-5 personnel, Numbered Air Force A-3 / A-5 personnel, and Numbered Fleet N-3 / N-5 personnel.

to translate objectives and guidance into congruent targeting actions. Moreover, these formal targeting schools should give serious consideration to offering an abbreviated targeting course for senior officers. The more knowledgeable senior military leaders are regarding the targeting process, the higher the probability that targeting activities under their charge will coincide with policy. Although it is unlikely these suggestions will correct all the ills associated with objectives and guidance determination—particularly those associated with vague and nondescript political objectives—these actions may help avoid many of the common pitfalls that occur at levels below the policy-maker.

FINDING #2: Target analysis inadequately supports the joint targeting process.

Target analysis is the centerpiece of target development. It is an eclectic, open-ended, and disciplined search for the most appropriate targets in support of the commander's objectives and guidance. Target analysis is not necessarily a quest to find the enemy's "Achilles heel," but a methodical investigation based on the available intelligence data to aid planners in reaching targeting solutions. The evidence presented in two of the case studies indicates that target analysis is a limiting factor in the joint targeting process.

Iraq's nuclear program and mobile Scud missile capability provide two examples of how deficient target analysis can negatively influence the joint targeting process. Despite having five and one-half months to analyze the Iraqi nuclear program during DESERT STORM, intelligence sources were only able to identify two probable nuclear-related sites. By the end of DESERT STORM, that number had risen to eight, which still fell well short of the more than twenty nuclear-related sites identified after the war by UN weapons inspectors. Ironically, most of Iraq's nuclear facilities were on CENTAF's target list, but had been placed into lower priority target categories because errant target analysis had failed to ascertain their true identities.

Target analysis also failed to provide sufficient targeting information regarding Iraq's mobile Scud missile threat. Intelligence sources underestimated the number of mobile launchers, did not adequately identify likely mobile launch areas, and inaccurately assessed Iraq's launch techniques and employment strategy. Consequently, CENTCOM

was woefully unprepared for the onslaught of Scud missiles that continually threatened the political viability of the Coalition throughout the 43-day conflict.

Incomplete target analysis was further observed during DESERT STRIKE. In at least one case, cruise missiles attacked an Iraqi IADS SOC that in all likelihood had been abandoned. In another instance, faulty target analysis caused planners to misinterpret an EW radar site, which resulted in the destruction of some decoy equipment while the actual radar system survived the attack. These two incidents attenuated the targeting effectiveness of DESERT STRIKE and jeopardized the overall success of the operation.

Causes

(1) Inadequate intelligence collection. The efficacy of target analysis depends to a large extent on the volume and accuracy of the available information at the analyst's disposal. DESERT STORM contained two examples that illustrated the obstacles to intelligence collection that can lead to inadequate target analysis. First, Iraq's comprehensive deception measures essentially defeated efforts by US intelligence community to gain access to its nuclear program. Rather than a critique, this example simply represents the realization that enemy efforts may indeed be able to mask significant capabilities, which will correspondingly affect target analysis. Second, institutional paradigms within the intelligence community can also impede intelligence collection efforts. Prior to the invasion of Kuwait, US intelligence resources were primarily interested in the Soviet military threat with few collection efforts dedicated toward regional threats in the Middle East. Iraq was, therefore, able to amass a very extensive and redundant nuclear program that US intelligence sources were unable to decipher during the intensive five and one-half month collection effort that took place prior to the war.

(2) Organizational friction. Target analysis is a collaborative effort between operations, intelligence, and targeting personnel; in the absence of effective coordination between these groups, comprehensive target analysis is largely an illusion. Consider, for example, the uncooperative working relationship between the Iraqi Planning Cell and CENTAF/IN before and during DESERT STORM. The distinct lack of coordination

between these two organizations virtually eliminated any analytical support that CENTAF/IN could have provided the Iraqi Planning Cell. As a result, many targets were selected by CENTAF without the benefit of adequate target analyses, which in the case of the Baghdad bridges, led to unforeseen damage to the Iraqi infrastructure. Similar cooperation problems were observed during DESERT STRIKE. Efforts by JCS/J2-T personnel to assist CENTCOM with target analysis were resisted, which resulted in at least two targeting mistakes during the operation.

(3) Insufficient planning time. With regard to target analysis, time is an absolutely critical commodity. Because target analysis is an open-ended process, its accuracy, and hence value, is in direct proportion to the amount of time allocated. The severe time constraints that impacted all planning phases of DESERT STRIKE also took their toll on the CENTCOM's analysis of the Iraqi IADS. The last minute retasking of the B-52s and the relatively disappointing results achieved during the operation illustrate the type of problems that can be encountered when inadequate time is devoted to target analysis.

Recommendation

The complex and divergent nature of these target analysis problems do not readily lend themselves to quick and easy solutions. Clearly, more research and thought must be devoted to target analysis before effective and lasting improvements can be implemented. One suggestion that could provide a basis for further study in this regard is the creation of a national targeting center designed specifically to support theater targeting requirements. Such a targeting organization could fuse military and governmental targeting resources and expertise under one roof in order to provide "one-stop-shopping" for all regional command targeting activities—including target analysis. The composition of this national targeting center could include operations, intelligence, and targeting personnel in addition to personnel from DIA, CIA, NSA, and various national collection agencies who by working together day in and day out would help forge stronger bonds between the communities, hence reducing institutional friction. In times of crisis, this center could provide both in-theater and reachback targeting support in the form of trained personnel and robust automated systems, which could noticeably reduce the time required to

conduct effective target analysis. Like any substantial organizational change, there would certainly be tremendous institutional inertia and growing pains to overcome before such a proposal could be made to work. Nonetheless, this daunting task should not discourage efforts to further examine the potential benefits that such an organization might provide for target analysis.

FINDING #3: Combat assessment does not provide meaningful and timely BDA.

BDA is that portion of combat assessment which evaluates targeting results. Done correctly, BDA estimates the physical damage, functional damage, and target system damage that result from the application of military force against a target. The primary intent of BDA is to assist the decision-maker in determining to what extent the objectives for the operation have been achieved. Evidence from both DESERT STORM and DELIBERATE FORCE suggests that battle damage assessment is utterly deficient in this regard.

The two principal areas of concern for BDA reporting during DESERT STORM were the strategic targeting efforts in Iraq and the attacks against Iraq's fielded forces in the KTO. The Iraqi Planning Cell's targeting strategy was designed to create parallel effects across a number of enemy systems. However, CENTAF's BDA procedures were ill-suited to support such a targeting strategy; and the BDA architecture suffered from serious computer problems and a lack of experienced collection managers and BDA analysts. As a result, the Iraqi Planning Cell was forced to seek BDA assistance from outside the theater in addition to implementing its own BDA expedients (i.e. cockpit video review) in order to support its targeting efforts.

BDA reporting in the KTO was designed to provide an accurate accounting of the Iraqi Army to help determine the timing of Coalition ground operations. To simplify the assessment process, BDA analysts opted to track quantitative attrition of the Iraqi Army as the measure of merit. However, without a command-wide standard for damage criteria to help guide the process, BDA estimates in the KTO became extremely contradictory, which caused CINCCENT to lose confidence in the process.

BDA reporting during DELIBERATE FORCE suffered a similar fate. It was obvious from the outset of the air campaign that the BDA apparatus was wholly unprepared for sustained operations. The first BDA report was not even published by the CAOC's BDA Cell until 48 hours into the operation. Poor weather and short-notice target changes continually hampered collection efforts, which plagued BDA efforts throughout the campaign. With untimely and incomplete BDA the norm, COMAIRSOUTH ultimately decided to rely on his own personal BDA criteria to measure the effectiveness of the targeting effort.

Causes

(1) Organizational shortfalls. BDA reporting is a process that connects the theater BDA cell with both combat units in the field and intelligence agencies and supporting commands at the national level. The efficacy of BDA hinges on the ability to fuse information from a variety of sources, analyze the information, and disseminate accurate results in a timely manner. To accommodate such a diverse and complex endeavor, two organizational characteristics are essential: a sound BDA architecture and competent personnel. During DESERT STORM, CENTCOM's combat assessment apparatus was merely a concept—it was never properly assembled and tested prior to the war. The architecture lacked leadership, connectivity, standardized procedures, and trained personnel to ensure the effective and timely flow of BDA information. This essentially created an internal friction within CENTCOM's BDA architecture that rendered the process largely useless.

During DELIBERATE FORCE, a partially functional BDA apparatus was implemented to support NATO's air operations. Connectivity had already been established between subordinate units, national support agencies, and the theater BDA Cell located in the CAOC. However, aside from the occasional "pin-prick" NATO airstrike against Serb forces during DENY FLIGHT, this BDA architecture remained untested and largely ignored. In addition, the BDA Cell suffered from a distinct lack of automated systems and was forced to rely on temporary personnel, many of whom had no formal training in BDA procedures. Consequently, with a BDA architecture ill-suited for sustained

operations and manned by mostly untrained personnel, BDA estimates in DELIBERATE FORCE quickly fell victim to the high operational pace of the air campaign.

(2) Inadequate procedures. To gain an accurate assessment of targeting efforts, BDA reporting must go beyond physical damage reporting and provide functional and systemic damage estimates. During DESERT STORM, BDA efforts were locked in paradigms that did not effectively measure the functional consequences of the targeting effort. Granted, the fog of war will never permit the 100 percent BDA solution. This, however, does not mean that procedures should continue to focus exclusively on less relevant measurement criteria. Targeting in Iraq, for instance, was based largely on achieving an effect on a target system, while CENTAF BDA reporting was focused on destruction reporting of individual targets. Likewise, KTO BDA reporting emphasized numerical attrition of the Iraqi Army while the psychological impact of the air operation was equal if not more relevant. In DELIBERATE FORCE, BDA reporting also focused on physical damage reporting to the exclusion of functional and systemic estimates. No procedures or manpower were in place to conduct detailed analyses beyond kinetic damage, which the CAOC overcame by ordering additional (and typically redundant) airstrikes to compensate for the lack of functional and systemic BDA capabilities.

Recommendation

Combat assessment is typically the forgotten step in the joint targeting cycle—both in peacetime exercises and during war. In the months preceding both DESERT STORM and DELIBERATE FORCE, no efforts were undertaken by CENTCOM or AIRSOUTH to exercise the BDA architectures. This pattern is consistent with the long-standing practice of simulating BDA procedures during most US military training exercises and clearly highlights an institutional proclivity that emphasizes target planning and execution over damage assessment. However, the convenience and cost efficiency of simulating the BDA process during joint training exercises (i.e. Internal Look 90) comes at the expense of meaningful and timely BDA during war—as was evident during both DESERT STORM and DELIBERATE FORCE. One way to correct the current BDA deficiencies, then, is to expose combat assessment personnel to practical training under realistic conditions during peacetime so that BDA skills can be developed and refined

before they are needed. Some joint exercises, including US Pacific Command's BRAZEN TIGER and US Atlantic Command's UNIFIED ENDEAVOR, do offer opportunities for combat assessment analysts to practice their trade.³¹⁸ However, these two exercises are considered the exceptions rather than the rule. To improve the process, realistic and fully integrated BDA reporting should be included as a standard part of all joint military exercises. This action will allow assessment personnel to experiment with and validate various BDA architectures, refine existing procedures, develop new methods, and reduce process timelines before these services are needed to support actual combat. In sum, encouraging more practical BDA training in peacetime will ultimately serve the consumers of BDA more effectively in wartime.

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Within the context of overwhelming force, the chronic deficiencies that impede the effectiveness of joint targeting do not appear to be catastrophic. But, as the inevitable “build down” of US military force continues to fuel a greater reliance on sophisticated weaponry, the pressures will begin to mount on the joint targeting process to deliver the goods. Up to now, the joint targeting cycle has not been stressed—truly hard targeting decisions have yet to be confronted. But it may not be long before US military power is unable to overcome the recurring deficiencies that pervade and degrade the joint targeting process. “Smart” weapons may represent the future of America’s combat arsenal, but “smart” targeting represents the future of America’s military might. Taking notice of the chronic ailments affecting the joint targeting process and implementing effective and lasting solutions will undeniably help preserve overwhelming military strength as a luxury for the US well into the next century.

³¹⁸ Maj David L. Glasgow, Joint Targeting School, telephonic interview with author, 21 April 1999.

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