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FOR DOCTRINE DEVELOPMENT AND EDUCATION

ANNEX 3-60 TARGETING

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INTRODUCTION TO TARGETING

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Targeting is the process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities.[1] Targeting is a command function requiring commander oversight and involvement to ensure proper execution. It is not the exclusive province of one type of specialty or division, such as intelligence or operations, but blends the expertise of many disciplines.

Targeting helps translate strategy into discrete actions against targets by linking ends, ways, means, and risks. It is a central component of Air Force operational art and design in the application of airpower. Strategy allows commanders to choose the best ways to attain desired outcomes. Strategy forms the plans and guidance that can be used to task specific airpower capabilities through the tasking process. The processes of planning, tasking, targeting, and assessing effects provide a logical progression that forms the basis of decision-making and ensures consistency with the commander's objectives and the end state.

Too often targeting is tied just to the tasking cycle and the delivery of kinetic capabilities. Targeting should occur in peacetime well before

Targeting and the Instruments of Power

There are times when targeteers may recommend the combatant commander (CCDR) request support from another government department or agency to achieve the desired objective. For example, CCDRs may want to conceal the deployment and disposition of their forces from an enemy. During combat operations, the enemy's terrestrial downlinks may be targeted for destruction. However, if combat operations have not yet started, how can CCDRs target their enemy's ability to receive satellite imagery? Perhaps they could select the diplomatic instrument of power (IOP) to get a third party country not to sell the imagery, or they could use the economic IOP to buy up the bandwidth or purchase the imagery at a much higher price. Personnel doing targeting need to consider all the possibilities when thinking about how to deny an adversary a certain capability.

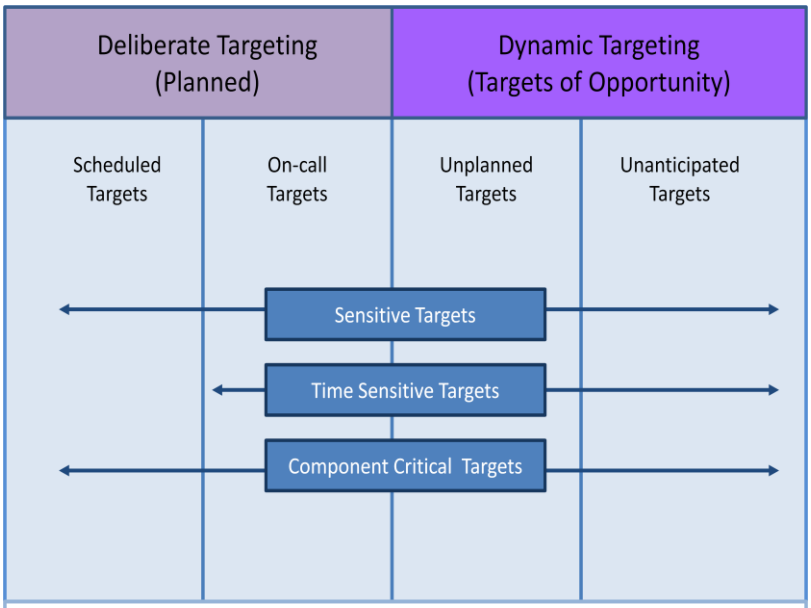
[1] JP 3-60, *Joint Operations*

hostilities and continue through post-hostilities. Targeting occurs at all levels of conflict (strategic, operational, and tactical), for all phases of operations (Phase 0 through Phase 5), across all domains, and across the range of military operations. Airmen tie the targeting process to creating specific desired effects that achieve objectives. Additionally, Airmen recognize that targeting is a systematic process of analyzing adversaries and enemies to determine critical vulnerabilities against which national capabilities can be applied to create specific desired effects that achieve objectives, taking into account operational requirements and capabilities.

A target is an entity or object considered for possible engagement or other actions.[2] Joint doctrine describes entities as facilities, individuals, equipment, virtual, and organizations. Targets are identified for possible action to support the commander's objectives, guidance, and intent. It is a fundamental tenet of targeting that no potential target derives its importance or criticality merely by virtue of the fact that it exists, or even that it is a crucial element within a target system and other interdependent target systems. Any potential target derives importance, and thus criticality, only by virtue of the extent to which it enables enemy capabilities and actions that must be affected in order to achieve the commander's objectives. Military actions employed may produce lethal or nonlethal effects. Information related capabilities (IRC) are tools, techniques, or activities employed within the information environment that may create nonlethal effects.[3]

Multiple actions may be taken against a single target, and actions may often be taken against multiple targets to achieve a single effect.

There are two categories of targeting: deliberate and dynamic (see the figure, Categories of Targeting and Targets). It is a mistake to associate deliberate targets with fixed targets and dynamic targets with mobile targets. Deliberate targeting applies when there is sufficient time to add the target to an air tasking order (ATO) or other plan. Deliberate targets include those planned for attack by on-call resources. The air tasking cycle is sufficiently flexible to allow for most mobile targets to be planned



Categories of Targeting and Targets

[2] Ibid. Note: There are several definitions of "target" in JP 1-02; this document uses the first of the term's four approved definitions.
[3] See JP 3-13, *Information Operations*, for an expanded discussion of IRCs.

and attacked with deliberate targeting.

Dynamic targets are either identified too late, or not selected in time to be included in deliberate targeting, but when detected or located, meet criteria specific to achieving objectives. When plans change and planned targets must be adjusted, dynamic targeting can also manage those changes.

Two subsets of targets require special consideration are sensitive and time sensitive. Sensitive targets are targets where the commander has estimated the physical and collateral effects on civilian and/or noncombatant persons, property, and environments occurring incidental to military operations, exceed established national-level notification thresholds.[4] Sensitive targets are not always associated with collateral damage related. They may also include those targets that exceed national-level rules of engagement (ROE) thresholds, or where the combatant commander (CCDR) determines the effects from striking the target may have adverse political ramifications. The other target category requiring special consideration, time-sensitive targets (TSTs)[5] are joint force commander (JFC) validated targets or sets of targets requiring immediate response because they are highly lucrative, fleeting targets of opportunity or they pose (or may soon pose) a danger to friendly forces.[6] These targets present one of the biggest targeting challenges. Additional information on time-sensitive targeting is provided in *Multi-Service Tactics, Techniques, and Procedures for Dynamic Targeting* (AFTTP 3-2.3).

[4] CJCSI 3122.06, *Sensitive Target Approval and Review (STAR) Process.*

[5] Some Airmen believe the term "time-critical target" better describes this subset of targets. Many targets are time-sensitive. Some targets, have a specific window of opportunity for synchronization or achievement of effect, while other targets require *immediate* response because they are highly lucrative, fleeting targets of opportunity or they poses (or may soon pose) a danger to friendly forces. For example, the ground component may want a bridge destroyed at a specific time to create a trap. This would be a preplanned target, which is also time-sensitive. If the enemy ground forces moved more quickly than anticipated and were about to use the bridge to facilitate an attack on friendly forces, the ground component commander may want the target status changed so a mission being executed could be diverted to drop the bridge. In both cases the bridge is a time-sensitive target, but in only one is it time critical.

[6] JP 3-60, *Joint Targeting*.

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TARGETING FUNDAMENTALS

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Targeting is focused on achieving objectives. Through targeting courses of action, objectives and effects are translated into detailed actions against adversary targets. **Every target nominated should in some way contribute to attaining the commander's objectives and end state**.

Targeting is fundamentally effects-based. Targeting is in part accomplished by targeteers who have specialized training in analyzing targets and developing targeting solutions to support the commander's objectives. In performing their job, they use the targeting cycle and an effects based approach to operations (EBAO).

Targeting is more than just the selection of targets for physical destruction; however this is a limiting perspective. Destruction may be the best means to the end, but it is only one effect within a spectrum of possible options, that may include influence operations, electronic warfare operations and network warfare operations. The underlying premise of an effects-based approach is that it is possible to direct the instruments of power -- diplomatic, information, military, economic (DIME) -- against targets in ways that cause effects beyond the mere destruction of targets. These effects will influence the adversary's political, military, economic, social, infrastructure, and information systems (PMESII). Targeting should consider all possible means to achieve desired effects, drawing from all available forces, weapons, and platforms. Target selection based upon desired effects includes consideration of second- and third-order consequences that may either positively contribute to campaign objectives or negatively outweigh the near-term results of the applied lethal or nonlethal capability.

Targeting is interdisciplinary. It requires the expertise of personnel from many functional disciplines. For example, strategists and planners bring knowledge of the context and integrated plans; operators bring experience gained from combat execution; intelligence personnel provide analysis of enemy strengths and vulnerabilities and targeting expertise; and judge advocates provide expertise in the application of the Law of Armed Conflict (LOAC) and interpretation of rules of engagement (ROE)vital for mission planning and weapons delivery. An effects-based approach to targeting is fundamentally a team effort, requiring these specialties and many more.

Targeting is inherently estimative and anticipatory. Matching actions and effects to targets requires estimating and anticipating future outcomes. In some cases the outcome is straightforward, such as anticipating that disabling a fire control radar may

significantly impact a surface-to-air missile battery's capabilities. In most cases, however, estimation is more complicated and planners should consider the following processes to aid in making estimates. The joint intelligence preparation of the operational environment (JIPOE) should yield insight on the enemy and his intentions. The target system analysis (TSA) yields understanding of how components of the enemy system interact and how the system functions as a whole. Intelligence, surveillance, and reconnaissance (ISR) gathers and processes needed data and helps improve the accuracy and extent of estimation. Such analyses enable planners to select targets and methods of affecting them that increase the probability of desired outcomes and allow the most efficient use of limited airpower resources. This does not imply perfect knowledge or anticipation; uncertainty and friction still apply.

Targeting is systematic. In supporting the commander's objectives, the targeting process is designed to achieve effects in a systematic manner. Targeting, like other planning processes that it complements, is a rational; iterative and methodically analyzes, prioritizes, and assigns forces and capabilities against adversary targets to achieve the effects needed to meet campaign objectives. While targeting is systematic, it is not mechanical and does not assume that the same actions always produce the same effects. If the desired effects are not achieved, targets may be replanned for subsequent engagement, or different targets may be selected.

Targeting is integrated with other processes. Targeting is essential to creating the operational strategy and the joint air operations plan (JAOP), the daily tasking cycle that produces tasking orders, and assessment that measures progress toward operation and campaign objectives. It cannot be separated from the overarching set of processes without resulting in an inputs-based exercise in target servicing—taking a target list, and matching available resources to those targets. Integrating targeting within these overarching processes enables an effects-based approach.

The attributes set forth above establish a broad framework on which the targeting discipline should build.

TARGET CHARACTERISTICS

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In general, there are five characteristics by which targets can be defined: *physical, functional, cognitive, environmental,* and *temporal.* The features of each category are briefly described below.[1]

- Physical Characteristics. These are features that describe what a target *is*. These are discernible to one or more of the five senses or through sensor-derived signatures. These may greatly affect the type and number of weapons, the weapon systems, and the methods or tactics employed against the target.

- Functional Characteristics. These are features that describe what the target *does* and how it does it. They describe the target's function within the enemy system, how the target or system operates, its level of activity, the status of its functionality, and, in some cases, its importance to the enemy. Functional characteristics are often hard to discern because they most often cannot be directly observed. Reaching plausible conclusions can often entail speculation and much deductive and inductive reasoning.

- Cognitive Characteristics. Features that describe how some targets *think*, exercise control functions, or otherwise process information. These can be critical to how something is targeted and can be especially important from an effects-based perspective, where information related capabilities (IRC) are considered. These characteristics can also be critical to targeting an enemy system, since nearly every system possesses some central controlling function, and neutralizing this may be crucial to obtaining the desired behavior. As with functional characteristics, these are often difficult to discern or deduce.

- Environmental Characteristics. These are features that describe the effect of the environment on the target and its surroundings. These characteristics may also affect the types and numbers of weapons, weapon systems, and the methods or tactics employed against the target.

- Temporal Characteristics. The factor of time, as a characteristic of a target, describes the targets vulnerability to detection, attack, or other engagement in terms of time available. All potential targets and all targets nominated for attack continually

[1] For more information on target categories, see JP 3-60, *Joint Targeting*.

change in priority due to the dynamic nature of the evolving operational environment. Many targets may be fleeting and some may be critical to friendly operations. Those that are both fleeting and critical present one of the biggest targeting challenges faced by the joint force. This time factor can help determine when and how to find or engage a target. By comparing this factor to information latency and knowledge of friendly capabilities, the staff can make better recommendations to the commander regarding possible actions.

THE TARGETING CYCLE

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Joint Targeting Cycle

The targeting cycle supports the joint force commander's (JFC) joint operation planning and execution with a comprehensive, iterative and logical methodology for employing ways and means to create desired effects that support achievement of objectives. The targeting cycle described in joint doctrine is also used for Air Force targeting operations. Joint targeting selects and prioritizes targets and matches the appropriate means to engage them, considering operational requirements and capabilities. The joint targeting cycle is an iterative, non-linear process that provides a framework for successfully conducting joint targeting. The deliberate and dynamic nature of the joint targeting cycle supports all of the planning horizons of the joint operation planning process/joint operation planning process for air (JOPP/JOPPA) future plans, future operations, and current operations.

The End State and Commander's Objectives. The military end state is the set of conditions that need to be achieved to resolve the situation or conflict on satisfactory terms, as defined by appropriate authority. The combatant commander (CCDR) typically may be concerned with the military end state and related strategic military objectives. The commander's objectives are developed during the mission analysis step of JOPP, or are derived from theater-strategic or national-level guidance. The commander, Air Force forces (COMAFFOR) staff, using the JOPPA[1], should establish

[1] For more on the JOPPA see JP 3-30, *Command and Control for Joint Air Operations*; Annex 3-0, *Operations and Planning*; and Chapter 3 of this publication.

the air component's objectives; the specified, implied, and essential tasks that support the CCDR's military objectives and contribute to achievement of the end state.

Objectives are the basis for developing the desired effects and the scope of target development. Attainment of objectives is essential to the successful realization of the desired end state. Effective targeting is distinguished by the ability to generate the type and extent of effect necessary to achieve the commander's objectives.

Target Development and Prioritization. Target development is the systematic examination of potential target systems to determine the type and duration of action that should be exerted on

each target to create desired effects that achieve the commander's objectives. Target development always approaches adversary capabilities from a systems perspective. Target vetting leverages the expertise of the national intelligence community to verify the fidelity of the intelligence and analysis used to develop the target(s). Target validation determines whether a target remains a viable element of a target system and whether prosecution of that target complies with the law of armed conflict and the rules of engagement. Validation is a continuous process that occurs until the target is serviced or removed from consideration for servicing. Once candidate targets are developed, vetted, and validated, they are added to joint target list (JTL) or restricted target list (RTL). During execution, they are prioritized relative to all joint targets in a joint integrated prioritized target list (JIPTL), which is submitted to the commander for approval.

While a single target may be significant because of its own characteristics, the target's real importance lies in its relationship to other targets within an operational system or across operational systems. A target system is most often considered as a collection of assets directed to perform a specific function or series of functions.

Capabilities Analysis. This portion of the joint targeting process involves evaluating available capabilities against desired effects to determine the appropriate options available to the commander. Inputs to this stage include target characteristics, desired damage criteria or probability of damage (Pd) calculations, and delivery parameters. The outputs of this stage include the probability of effectiveness (Pe) which is the result of selected capabilities and target pairings required to create desired effects to inform the commander's estimate within the joint planning and execution system.
Commander's Decision and Force Assignment. The force assignment process integrates previous phases of joint targeting and fuses capabilities analysis with available forces, sensors, and weapons systems. It is primarily an operations function, but requires considerable intelligence support to ensure Intelligence, surveillance, and reconnaissance (ISR) assets are integrated into the plan. The process of resourcing joint integrated prioritized target list (JIPTL) targets with available forces or systems and ISR assets lies at the heart of force assignment. Once the JFC has approved the JIPTL, either entirely or in part, tasking orders are prepared and released to the executing components and forces. The joint targeting process facilitates the publication of tasking orders by providing amplifying information necessary for detailed force-level

planning of operations. Coordination with other services and special programs at this point in the process is essential to ensure that targets are not serviced by multiple or conflicting resources.

Mission Planning and Force Execution. Upon receipt of tasking orders, detailed planning should be performed for the execution of operations. The joint targeting process supports this planning by providing tactical-level planners with direct access to detailed information on the targets, supported by the nominating component's analytical reasoning that linked the target with the desired effect (conducted in Phase 2 of the joint targeting cycle). This may provide the background information necessary for the warfighter to focus on the JFC's objectives as the operation unfolds.

Assessment. Assessment measures whether desired effects are being created, objectives are achieved, and next steps are evaluated. Effective planning and execution require continuing evaluation of the effectiveness of friendly and enemy action. Consequently, assessment is much more than "battle damage" or "combat assessment," as it has traditionally been presented—and more than just an intelligence function that takes place after execution has concluded. Planning for it begins prior to commencement of operations, takes place throughout planning and execution, and continues after the conflict is over. The assessment phase is common to both deliberate and dynamic targeting. The assessment of deliberate and dynamic target engagement results must be integrated to provide the overall targeting assessment.

EFFECTS-BASED APPROACH TO OPERATIONS

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In the most fundamental sense, **effects-based approach to operations** **(EBAO) is defined as an approach in which operations are planned, executed, assessed, and adapted to influence or change systems or capabilities in order to achieve desired outcomes**.[1] Consequently, targeting personnel seek to understand and exploit the complex connections among individual actions, the effects—direct and indirect—that actions produce, how those effects influence the states and behaviors of complex systems in the operational environment, and how effects contribute to the accomplishment of ultimate desired outcomes.

Effects **are the physical or behavioral state of a system that results from an action, a set of actions, or another effect**.[2] They are the full range of outcomes, events, or consequences of a particular cause. A cause can be an action, set of actions, or another effect. Effects join actions to objectives. The actions and effects in any causal chain can derive from any instrument of national power—diplomatic, informational, military, economic (DIME), and may occur at any point across the range of military operations from peace to global conflict. Properly understanding the relationship among effects at all levels is important to planning and conducting any campaign.

Effects can be intended or unintended, direct or indirect, lethal or nonlethal. Intended and unintended are straightforward in meaning. A **direct effect** **is the first-order result of action with no intervening mechanism between act and outcome**—usually immediate and empirically verifiable, like the results of weapons employment. Indirect effects are more complicated**. An indirect effect** **is a second-, third-, or higher-order effect created through an intermediate effect or causal linkage following a tactical action**—usually a delayed and/or displaced consequence associated with the action that caused the direct effect(s). Direct and indirect effects can be intended or unintended. Objectives are achieved through an accumulation of direct and indirect effects, but the effects sought at the strategic and operational levels are almost invariably indirect.

[1] Annex 3-0, *Operations and Planning*.
[2] Ibid.

Effects are often categorized as physical or behavioral; are assessed functionally or systemically. Physical effects materially alter a system or target and are most important at the tactical level. Behavioral effects are those that impact reasoning, emotion, and motivation and result in measurable changes in behavior. Functional effects relate how well a system performs its intended function(s) and systemic effects relate how well that system functions as a component of larger systems. These are most important for assessment considerations.

Effects can be imposed cumulatively or in a cascading manner, sequentially or in parallel. Effects can accumulate over time leading to gradual change, or can be cascading changes that occur catastrophically and ripple through related and subordinate systems. Often, there are both cumulative and cascading components to effects. Effects can also be imposed sequentially or in parallel. Effects imposed in series, one after another over time, are sequential. Those imposed near-simultaneously are parallel effects, which may place greater stress upon targeted systems and require faster adaptation. Full understanding of the types of effects and the principles of effects-based thinking can offer commanders more options, hasten success, and lead to success with lower cost in terms of lives, assets, and time.

It is vital to remember that many effects are created through processes other than military targeting. **The diplomatic, information, and economic instruments of national power may create effects that negate the requirement for, or complement military action by contributing to the accomplishment of objectives and end states and therefore should be considered in an effects-based approach.**

TARGETING ACROSS THE RANGE OF MILITARY OPERATIONS

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Airmen apply the targeting process across the range of military operations (see figure, Range of Military Operations). In the past, some thought of targeting only in terms of dropping bombs on targets. The same process used to identify critical vulnerabilities and recommend an appropriate capability to use against that vulnerability should be used to determine how to shape the operational environment.

Range of Military Operations (Adapted from JP 3-0)

"Airpower is more than dropping bombs, strafing targets, firing missiles, providing precision navigation and timing, or protecting or attacking networks. It is also a way of influencing world situations in ways that support national objectives."[1] For example, when and where to apply airdrop operations, whether for humanitarian relief or troop re-supply, requires the same targeting principles to deliver an aerial solution to the point of influence. All operations focus on affecting the perceptions and behaviors of leaders, groups or entire populations—to influence them. In some sense, all strategies, even those involving pure attrition of enemy military forces, are thus "influence operations," in that all seek to somehow modify or otherwise affect the behavior of actors in the operational environment.

Airmen should seek to understand how to influence the behaviors of adversaries and should focus on shaping and deterring combat operations. This includes considerations for what targets are vulnerable and susceptible to influence, what capabilities can be

[1] Volume 1, *Basic Doctrine*

applied to achieve the desired results and how to access the results once those capabilities have been applied. The targeting cycle should be used in all phases of an operation.

ANNEX 3-60 TARGETING

COMMAND AND ORGANIZATION

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Targeting occurs from the combatant command level to the tactical unit level. Across this organizational span, Air Force targeting focuses on a wide variety of targeting issues both within and outside of the targeting cycle such as: target planning, target materials production, targeting database maintenance, target systems analysis, targeting automation and support to weapons acquisition. The air component is responsible for enacting the targeting process for the joint force commander (JFC) and servicing approved targets, regardless of which service or functional component nominates them. Within this command structure the targeting cycle of planning, execution and assessment occurs under a very structured process, and normally under a compressed timeline.

JFCs have many options for organizing the joint force. JFCs organize forces to accomplish the mission based on their vision and concept of operations and they provide direction and guidance on command relationships. How the JFC chooses to organize impacts where certain targeting responsibilities are retained, either at the JFC level or delegated to the commander, Air Force forces (COMAFFOR). Regardless of the organizational option chosen, fundamental doctrinal principles of the joint targeting process should be employed.

The COMAFFOR establishes a close working relationship with the JFC. This relationship extends through the JFC and COMAFFOR staffs and other component staffs with a role in supporting the JFC with targeting capabilities. The COMAFFOR normally operates from an air operations center (AOC). The AOC and the COMAFFOR's staff are manned with subject matter experts who reflect the capabilities/forces available to the COMAFFOR for tasking and include appropriate component representation.

Air Operations Center (AOC). During day-to-day operations, the AOC plans, directs, and monitors theater air component operations including integrated targeting activities.[1] It continually surveys the environment and provides predictive awareness so the

[1] Air Force doctrine recognizes that the air operations center (AOC), in joint or combined operations is correctly known as a joint AOC (JAOC) or combined AOC (CAOC). However, doctrine simply uses the term "AOC."

COMAFFOR can effectively prepare for crisis operations. AOC members also plan and coordinate future air operations with the AFFOR staff.

In most joint and coalition operations, the AOC forms around the AOC crew as augmented by allied/coalition/joint personnel. The COMAFFOR employs the AOC to maneuver and mass airpower through centralized control and decentralized execution to produce desired strategic, operational, and tactical effects in support of the JFC's intent.

The AOC operates as a fully integrated command center and is staffed by all participating components. The AOC provides the capability to plan, coordinate, allocate, task, execute, monitor, and assess the activities of assigned or attached forces. Staffing includes functional area experts [e.g., Intelligence, surveillance, and reconnaissance (ISR)], meteorological and oceanographic, logistics, space operations, legal, airspace, plans, and communications personnel) and mission experts (e.g., air-to-air, air-to-ground, ground-to-air, information operations, reconnaissance, air refueling, and other areas). Liaison elements and joint/coalition participants are embedded in this structure.[2] The nucleus of the COMAFFOR staff should be trained in joint air operations and be representative of the joint force. The COMAFFOR normally has a targeting effects team (TET)as part of the AOC, with responsibilities varied but key to the targeting process. The TET includes embedded personnel from the targets and tactical assessment (TGT/TA) Team of the ISR division. It links targets and capabilities to guidance on desired effects, deconflicts and coordinates target nominations and provides other targeting support requiring component input at the operational level. If the JFC delegates joint targeting coordination authority to the COMAFFOR, the TET also receives all target nominations and prioritizes them to form the draft joint integrated prioritized target list (JIPTL).

US Air Force C2 System

The theater air ground system (TAGS) is a system of systems that consists of component C2 elements for the purpose of working together in planning and executing operations. TAGS enables employment of the air targeting cycle from the operational to the tactical level. Comprised of airborne and ground elements, the Theater Air Control System (TACS) is the Air Force component of TAGS and the mechanism for C2 of airpower.[3] The AOC is the senior C2 element of the TACS.

The air support operations center (ASOC) is the tactical level organization that facilitates Air Force-Army integration and provides primary control of air power in support of the Army continuing down through the TACS Air Force component liaisons aligned with land combat forces. The ASOC's primary mission is to provide direction and control of air operations directly supporting Army ground forces. Within the targeting arena, this is a critical component in that it supports deliberate targeting

[2] IRC requirements may entail IO, space, and cyberspace integrated elements or liaisons that provide the functional expertise to integrate target development, approval, and capabilities employment though the appropriate command chain for every phase of the planning cycle.
[3] AFTTP(I) 3-2.17, *TAGS, Multi-Service Tactics, Techniques, and Procedures for the Theater Air Ground System.*

requirements during planning and fulfills the dynamic targeting role where immediate targeting supports Army forces.

The Joint Air Component Coordination Element (JACCE)**.** The COMAFFOR may establish one or more joint air component coordination elements (JACCEs) with other commanders' headquarters to better integrate joint air operations with their operations. The JACCE is a service/functional component level liaison that serves as the direct representative of the COMAFFOR/JFACC.[4] The JACCE can be critical to targeting processes. For example, the JACCE located with the joint force land component commander (JFLCC) provides valuable assistance and liaison from the JFACC/COMAFFOR and assists the JFLCC in planning and synchronizing operational fires and the establishment and control of fire support coordination measures (FSCMs).[5]

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[4] JP 3-30, *Command and Control for Joint Air Operations.*
[5] JP 3-31, *Command and Control of Joint Land Operations.*

TARGETING AND TARGETING RELATED RESPONSIBILITIES

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COMAFFOR Responsibilities[1]

The targeting responsibilities of the commander, Air Force forces (COMAFFOR) are assigned by the joint force commander (JFC). As the air component facilitator for servicing of all targets nominated for airpower effects, the COMAFFOR is responsible for establishing a targeting process that meets the needs of the JFC and all represented components within the air operations center (AOC). Targeting processes are inherent to or affected by the COMAFFOR responsibilities listed below.

- Plan, coordinate, integrate, task, and direct the joint air effort in accordance with the JFC's guidance and joint force objectives.
- Develop a joint air operations plan (JAOP) derived from the JFC's broader objectives for the operation, and guidance regarding the roles, missions, tasks, and responsibilities of joint capabilities and forces.
- Recommend, after consulting with other component commanders, apportionment of the joint air effort that should be devoted to various air operations for a given period of time.
- Translate air apportionment into allocation and develop targeting guidance into the air tasking order, which may include specific aimpoints.
- Conduct target development and produce required target materials for operational and tactical level force employment planning and execution.
- Direct and ensure deconfliction of joint air operations.
- Integrate and synchronize joint air operations.
- Coordinate with the appropriate components, national agencies, and liaison elements for synchronization and deconfliction with land, maritime, space, cyberspace, and special operations.

[1] These are the COMAFFOR's responsibilities unless the JFC has appointed a Joint Force Air Component Commander (JFACC).

- Coordinate with the appropriate components' agencies and liaison elements for tasking of the capabilities and forces made available.
- Monitor execution and redirect joint air component operations as required.
- Compile component target requirements and prioritize targets based on JFC guidance.
- Establish rules of engagement (ROE) and special instructions (SPINS) that state clear combat identification (CID) requirements; for example, which CID systems may be used, who can declare a track hostile, etc.
- Accomplish tactical and operational assessment and support accomplishment of campaign and national assessment.

Unit-Level Targeting Responsibilities

Individual units have targeting responsibilities that support and enhance air operating center (AOC) efforts and tactical-level execution. Commanders, mission planners, and intelligence specialists within these units should ensure the validity and accuracy of the targeting information provided them for mission planning purposes. This responsibility may include verification of air tasking order (ATO) guidance coordinates and adjudication of problems with the AOC if errors or conflicts become evident. Specific data provided to mission planners should be checked for integrity, including verification of the joint desired point of impact (JDPI) coordinates and elevations, weapon azimuths and impact dive angles, and fusing instructions when direct electronic transfer of such data is not possible or fails.

Considerable benefits are realized when air and ground units work together directly to accomplish mission planning at the tactical level. Army ground liaison officers (GLO) working with tactical air units can provide insight into ground component plans and offer direct coordination for missions flown in support of the ground commander's intent. Air liaison officers (ALO) are aligned with tactical ground maneuver units and serve as advisors to ground commanders on targeting and other aspects of airpower. Such coordination is essential for joint operations.

ESTABLISHING COLLABORATIVE AND SUPPORT TARGETING RELATIONSHIPS

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Targeting is a collaborative effort. Targeteers are consumers of multi-source intelligence data and operate across both the intelligence and operations functions. Manning and targeting resources at the joint task force (JTF), air operations center (AOC), and Joint Intelligence Operations Center (JIOC) are typically insufficient to support robust target planning and execution. The targeting process requires resources from many organizations to meet the commander's targeting demands. Targeting therefore requires reachback support via distributed and federated operations to be effective. Communications, information, and targeting systems of record should be established and coordinated to provide a seamless information flow of data to and from forward and rear locations.

Reachback is the process of obtaining products, services, and applications, or forces, or equipment for material, from organizations not forward deployed. For example, during crisis planning or contingency operations, the Air Force Targeting Center may stand up a crisis management element (CME) to provide direct targeting support to the commander, Air Force forces (COMAFFOR). Personnel assigned to the CME may operate in a supporting relationship to the COMAFFOR.

Distributed operations in support of targeting occur when independent or interdependent nodes or locations participate in the operational planning and/or operational decision-making process to accomplish goals/missions for engaged commanders. In some instances, the commander may establish a formal supported/supporting relationship between distributed nodes. In other instances, distributed nodes may have a horizontal relationship.

Split operations are a type of distributed operations. The term describes those distributed operations conducted by a single entity separated between two or more geographic locations. A single commander should have oversight of all aspects of a split operation. For example, sections of the air tasking order (ATO) may be developed from a rear area or backup operation center to reduce the deployed AOC footprint. In this case, the AOC is geographically separated and is a split operation. During split operations, the COMAFFOR has the same degree of authority over geographically separated elements as he or she does over the deployed AFFOR and AOC.

Although distributed operations are similar to reachback, there is one major difference. Reachback provides ongoing combat support to the operation from organizations that are not forward deployed, while a distributed operation indicates teaming with forward deployed independent or interdependent nodes. With distributed operations, some

During the course of Odyssey Dawn, the Air Force Targeting Center developed approximately 75 percent of our targets, 90 percent of our weaponeering solutions and over 90 percent of our TLAM targets. But that's not all...

Since minimizing collateral damage was a primary objective, pre-strike collateral damage estimates and post-strike battle damage assessments were critical to making effective operational decisions.

The Targeting Center combined Airmen from multiple targeting related disciplines into a single support cell, using newly created procedures and sensitive intelligence to provide rapid, accurate assessments on both sides of the kill chain. All told, the Targeting Center provided approximately three-quarters of our collateral damage and virtually all our battle damage assessments. In my estimation, our ability to rapidly find, fix and target the enemy was a game changer in Odyssey Dawn.

—Maj Gen Margaret H. Woodward
Commander 17th Air Force and U.S. Air Forces Africa

—Remarks at the Air Force Association's 2011 Air & Space Conference & Technology Exposition, National Harbor Md., Sept. 21, 2011

operational planning or decision-making may occur from outside the joint area of operations. The goal of effective distributed operations is to support the operational commander in the field; it is not a method of command from the rear. The concept of reachback allows functions to be supported by a staff at home station, to keep the manning and equipment footprint smaller at a forward location.

Federated operations are based on the needs of geographic combatant commanders, JFCs, or COMAFFOR. Joint targeting federation needs are coordinated with the larger joint community and national agencies through the JTF staff J-2's targeting directorate. Coordination should delineate specific duties to federated partners, establish timelines, and determine the methods of communication to be used.

While the COMAFFOR may have direct authority over some units, he/she may not have control over targeting organizations beyond the AOC and those units/personnel who augment the air component. The AOC is nominally manned day-to-day to support

phase-zero and phase-one planning, but may not be suitably manned to support phase-two through phase-five operations. It is therefore crucial that theater strategists, planners, and targeteers develop the necessary relationships with supporting organizations so that surge planning and crisis operations beyond phase-one are in place. When an operation is at execution phase, it is normally too late to establish formal/informal relationships that can support the rigid targeting ops tempo of combat. Formal relationships for targeting support, through federation, distributed or reachback should be established and documented in the operations plan (OPLAN), joint air operations plan (JAOP), and memoranda of understanding/memorandum of agreement (MOU/MOA) whenever possible.

Targeting expertise is spread across the DOD enterprise that encompasses a range of targeting capabilities and specialization. Key organizations and capabilities are listed in Appendix B.

TARGETING AUTOMATION

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The forces the commander, Air Force forces (COMAFFOR) presents to the joint force commander (JFC) should include all the equipment they require to conduct combat operations. This includes target data and materials, especially for mission areas like strategic attack and counterair, which are conducted principally by the air component.

Targeting data and information should pass seamlessly horizontally, vertically and across domains. Target and information systems of record between Service and joint organizations may not be identical or interoperable in all cases. Therefore when targeting support and supporting relationships are established they should confirm connectivity or identify agreed workarounds that allow reachback, distributed and federated support functions. The following sections discuss common targeting tools and applications.[1]

Targeting Tools. Automated tools assist targeteers through the targeting process of the joint targeting cycle. Typically, there is no distinction between deliberate and dynamic targeting tools other than the time constraints for their use.

Analytical Tools. Targeting requires all-source intelligence data, systematic analysis and the appropriate tools for planning, execution and assessment during all phases of operations. While specific details are beyond the scope of this document, commanders should ensure that targeteers, all source analyst, and collection managers have the tools necessary to collect and analyze the information they need for targeting.

Geospatial Intelligence Tools. Geospatial intelligence (GEOINT) is "the exploitation and analysis of imagery and geospatial information to describe, assess and visually depict physical features and geographically referenced activities on the earth." GEOINT is necessary for operational environment visualization, enabling planners to "see" natural and cultural features. Most geospatial products are now presented in digital formats and are available through web access and automated means. As one example, scene visualizations provided by air operations center (AOC) weather personnel incorporate atmospheric effects from sensor to and at the target and may aid targeteers and mission planners in seeing a variety of these features. Commanders need to

[1] For more on targeting automation see JP 3-60, Appendix B.

ensure that all planning processes have access to appropriate digital tools and back-up systems for use by AOC personnel.

Targeteers need access to current imagery for target development and assessment. Numerous types of geospatial/imagery products can be requested from various joint and national agencies, service centers, and component organic production, exploitation, and dissemination (PED) organizations. Imagery sources include national technical means, tactical or commercial.

Targeteers also require mensuration tools to provide precise coordinates with the accuracy necessary for precise munitions employment. Point mensuration tools needed for these activities include a digital point position database (DPPDB) controlled/rectified by the National Geospatial-Intelligence Agency (NGA).

Capability Analysis Tools. The Joint Munitions Effectiveness Manual (JMEM) Joint Weaponeering System (JWS) provides the standard automated methodology for estimating the employment effectiveness of most non-nuclear, kinetic weapons and facilitating decision-making for force sizing. The JWS augmented by the Integrated Munitions Effectiveness Assessment (IMEA) tool, is a modeling application specifically designed to estimate weapon effectiveness against hard and deeply buried targets (HDBT) and chemical, biological, or radiological plume hazard in support of collateral damage estimation when targeting weapons of mass destruction (WMD) threats. The Joint Capabilities Analysis and Assessment System (JCAAS) includes tools that support weaponeering for cyber, electronic attack, and MISO. As nonlethal capabilities continue to evolve, decision-makers and targeteers may need to be trained in the integration and blending of traditional and non-traditional capabilities and methods in order to fully exploit effects-based approach to operations (EBAO). Commanders can assist by ensuring targeteers have tools to exploit such capabilities as they become available.

Collateral Damage Estimation Tools. Collateral damage estimation (CDE) is the process that determines undesired consequences and hazards presented by weapons effects and makes recommendations on how to mitigate those effects in compliance with rules of engagement (ROE) and law of armed conflict (LOAC). CDE analysts should apply the specific guidance and data of CJCSI 3160.01A, *No-Strike and Collateral Damage Estimation Methodology*; however, the joint community has mandated use of the Digital Precision Strike Suite Collateral Damage Estimation tool for collateral damage analysis of kinetic weapons.

Common Operating Picture (COP) Tools. A COP of the environment assists the targeteers in determining deliberate and dynamic targeting requirements.

BASIC ENCYCLOPEDIA NUMBER (BEN) AND DPI STANDARDIZATION

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Entity, or target, identifiers are a unique alphanumeric convention that can be assigned to a range of entities, including facilities, individuals, equipment, organizations, and virtual. One example of an identity identifier target ID is the widely recognized BEN system. All involved targeteers should understand an operation's theater BEN plan. While many targets already have unique entity identification assigned, many identified during combat do not. Without an established plan for assigning BENs, components may take it upon themselves to assign them, creating the potential for confusion and incompatibility with targeting automation and databases. Confusion can adversely affect the battle rhythm, or worse, result in targeting errors. Standard desired point of impact (DPI) numbering is also important, especially given that much DPI production will be federated to multiple organizations. A theater DPI registry may ensure standardization of DPIs and eliminate duplication and possible error.

The naming convention should address both static and mobile targets. It is usually not feasible to assign standard BENs to mobile targets including high-value targets. However, for proper data base management, such mobile targets still require some sort of identification. While the numbers may not be actual BENs, the theater should still have some way of identifying the target. Again, air operations center (AOC) planners should understand the theater naming convention to minimize targeting errors and the time needed for effective air planning.

Proper database management is necessary for effective targeting. Many systems used in the field are "stovepiped" and cannot talk to one another. If interoperable systems and databases are not available, it is the responsibility of the end users of the problematic system to work with the targeting and systems maintenance staffs to develop procedures (in peacetime) to overcome the difficulties associated with using systems that are not interoperable. There are many users of information in the AOC. Ideally, everyone should work from the same database to facilitate effective use of manpower and coordination.

Targeteers should coordinate with many different teams to ensure the flow and management of data and database information in the AOC is as seamless as possible.[1] Those with whom targeteers should coordinate include (but are not limited to):

- Analysis, Correlation, and Fusion Team (ACF Team). The ACF Team in the intelligence, surveillance, and reconnaissance division (ISRD) is responsible for updating enemy order of battle (EOB) databases. Targeteers should be able to pull from this database to ensure targeteers are using the most current EOB.

- ISR Operations Team. The ISR Ops Team in the ISRD is responsible for planning and coordinating intelligence-gathering missions by air component assets. They also have insight into intelligence-gathering platforms that the air component does not own, including spacecraft. Ensuring targeting and collection management databases are the same may reduce the time required to task collection assets to support targeting efforts, especially in the case of dynamic targeting.

- Targets and Tactical Assessment (TGT/TA). The TGT/TA team is comprised of two primary cells, the target development cell and the TA cell, which provide direct support and embedding of personnel to other AOC divisions to ensure continuity in the targeting effort. This team provides full-spectrum effects-based approach to operations (EBAO) based targeting development, solutions, and products/materials in support of the air tasking cycle. It is also responsible for assessing the immediate results and effects of tactical operations. Often, these assessments lead to some type of follow-on action by friendly forces.

- Senior Intelligence Duty Officer (SIDO) Team. The ISR Team in the combat operations division (COD), led by (and sometimes consisting only of) the senior intelligence duty officer (SIDO), provides intelligence support to ATO execution in the areas of analysis, collection management, targeting, and assessment. Having main targeting databases interact with those in the combat operations division is essential for seamless targeting support when the ATO requires modification. This importance is magnified when supporting dynamic targeting operations, especially those involving time sensitive targets (TST).

- Operational Assessment Team (OAT). The OAT in the SD is responsible for determining whether or not desired effects are being created and if those effects are leading to the attainment of CFACC and CFC objectives. The targeting database should be interoperable with that used by the OAT so that specific targets can be tracked to specific effects and objectives.

- Strategy Plans Team. The strategy plans team in the strategy division is responsible for building the overall air component strategy and is responsible for producing the Joint Air Operations Plan (JAOP). This phase of planning may involve a need to access targeting databases in order to support JAOP creation.

[1] See Air Force Instruction 13-1 AOC, Volume 3 for an expanded discussion on AOC divisions and teams.

- The Strategy Guidance Team. The strategy guidance team is responsible for the AOC's transition from operational-level to tactical-level planning and culminates in the air operations directive (AOD). The guidance provided is typically short-range; 24-hours to 10 days from execution. This team develops operational guidance, prioritizes operational and tactical objectives, and determines tactical allocation.

- Information Operations Team (IOT). The IOT is responsible for identifying and integrating employment of information related capabilities (IRCs) into targeting and planning to achieve desired effects. Based upon its full integration throughout the AOC planning cycle, the IOT is also often able to recommend different options or parallel courses of action to maximize success in achieving a specific effect.

- Special Technical Operations Team (STOT). The STOT is responsible for maintaining access to and identifying the correct billets for special technical operations information. This billeted-access program informs the appropriate personnel of specialized capability options to achieve desired effects in support of the commander's priorities. The STOT is responsible for ensuring a compartmented joint integrated prioritized target list (JIPTL), is available to the commander to augment the primary draft-ATO and a STO representative should be intimately involved throughout the ATO planning cycle.

The main targeting database is the modernized integrated database (MIDB) with its associated data access layers, which can be accessed via the joint targeting toolbox (JTT) and command and control (C2) tools like the Theater Battle Management Core System (TBMCS). Problems with compatibility between upgraded versions of MIDB and TBMCS has forced targeteers in some theaters to utilize workarounds in order to transfer data between systems. Specialized databases also exist with functional tools like JCAAS and the Space Integrated Planning Service (SIPS). Given the potential for incompatibility and diverging information, a thorough understanding of the interoperability and processes to maintain synchronicity between databases and C2 tools is necessary for successful execution of operations.

Steps have been taken to prevent datum errors. CJCSI 3900.01C, *Position (Point and Area) Reference Procedures*, was produced to provide clear guidance on the use of both horizontal and vertical datums and standard coordinate and height formats for most operations. The National Geospatial-Intelligence Agency (NGA) produces all new maps with the WGS-84 datum and in joint operations users should now reference horizontal and vertical coordinates to this datum. GPS also broadcasts its coordinates in this same datum. However, some possibility for error still exists. NGA reproduces certain older maps that use a WGS-72 datum. Also, if one is forced to use local maps, different countries use different datums. Most of the time, utilizing datum conversion software can minimize the possibility for error. In any case, targeteers should understand the different datums used in their theater prior to hostilities so measures can be taken to ensure accurate coordinates are provided to warfighters.

Limiting the number of datums used in theater is the obvious solution. However, as this is not always possible, especially in coalition operations, targeteers should be aware of the different datum needs of all the capabilities that may be used in the operation.

TARGET PLANNING

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From guidance to assessment, targeting is a critical component in activities across the range of military operations. Air Force targeting principles may be applied to all instances in which military force is planned and executed. Air Force targeting personnel are involved in activities in all levels of command and operations. Targeteers and other planners should keep effects-based concepts in mind while building formal plans and conducting ongoing deliberate targeting once operations begin.

Planning encompasses all the means through which strategies and courses of action (COA) are developed, such as operational design, deliberate planning and crisis action planning. As a Service and as part of a joint or combined force, the Air Force uses the joint operations planning process for air (JOPPA). This process is the air component's equivalent of the joint for commanders' (JFC) joint operation planning process (JOPP) and is often performed in sequence or parallel with it. The JOPPA produces the joint air operations plan (JAOP) and the air operations directive (AOD), which guides the tasking cycle through its iterative execution as part of an ongoing battle rhythm. Since it sets the stage for all other actions, planning is where effects-based principles have the largest play and may have the greatest impact on operations. Plans should tie objectives, actions, and effects at all levels together into a logical, coherent whole strategy.

Targeting supports operational-level planning and validates that operational plans can be accomplished within the time and resources available. This support also helps create the detailed tactical-level products, usually appended to operational-level plans, for the opening phases of action. The objectives, guidance, and intent derived during planning guide all efforts, including targeting, throughout employment and assessment. This serves to inextricably tie planning, employment, and assessment together. Further, planning continues once operations commence and the battle rhythm is under way. Operational planning continues as adversary actions are evaluated or anticipated through revision of strategy and implementation of branches and sequels.

Targeting planning is divided into two categories, deliberate and dynamic. Deliberate targeting normally supports the future plans effort which is focused on all planning activities from 72/96 hours out to, but not including, the current air tasking order (ATO)

execution day; whereas, dynamic targeting normally supports the current ATO execution with immediate targeting responsiveness to the active environment created by ongoing weapons employment and real-time, all-source identification of emerging and time sensitive targets (TSTs) (i.e., unplanned and unanticipated targets).

Targeting support to formal operational planning, and the deliberate targeting conducted once operations begin, are both accomplished through the deliberate targeting process described in this chapter. Deliberate targeting is the procedure for prosecuting targets that are detected, identified, and developed in sufficient time to schedule actions against them in tasking cycle products such as the ATO. Deliberate targeting handles targets in one of two ways: 1) plans and schedules specific actions against specific targets and 2) creates on-call packages or missions that deal with targets through pre-determined concept of operations (CONOPS). Preplanned missions are typically used against fixed targets or targets that are transportable, but operate in fixed locations. However, deliberate targeting can be used against mobile targets. On-call missions can be used against fixed, transportable, and mobile targets. For instance, a fixed building may be watched, but does not become a target until some critical person, group, or equipment arrives, at which time the on-call mission is scheduled on the tasking order if intelligence arrives in sufficient time. Other potential targets that are detected or become significant during the current execution period (once all formal products of the planning and tasking processes are issued), including the JFC's TSTs, are dealt with using dynamic targeting.

Target nomination processes remain unchanged when addressing offensive, nonlethal operations and should be leveraged appropriately by planners. That is, target development and selection are based on what the commander wants to achieve rather than on the available ways and means to achieve them. Therefore, nonlethal targets should be nominated, vetted, and validated within the established targeting processes.

The effects-based principles set forth in Annex 3-0 should guide all planning efforts, including targeting. An effects-based approach is even more critical for success in stability operations such as counterinsurgency and peace enforcement, because they may rely more on nonlethal means and less on types of effects for which cause and effect are well understood. Effects-based approach to operations (EBAO), and in particular targeting, ensures that every effect delivered can be linked to the JFC's end state, objectives, and plans. Within targeting, EBAO focuses on why we are taking an action rather than what action we are taking. To exploit the full range of possible effects in a given situation, planners should understand what effects are, how they relate to actions and objectives, how to measure different effects, and how various types of effects can be exploited to yield desired outcomes.

TARGETING DURING FORMAL PLANNING

Targeting supports every form of employment planning for joint operations. Joint operation planning employs an integrated process for orderly and coordinated problem solving and decision-making of JFC's desired objectives. In its peacetime application, the process is highly structured to support the thorough and fully coordinated development of contingency plans. In crisis, the process is shortened as needed to support the dynamic requirements of changing events. In wartime, the process adapts to accommodate greater decentralization of joint operation planning activities. Joint operation planning is conducted through one of the three following processes.

- **Campaign Planning** translates national and theater strategy into strategic and operational concepts through development of an operation plan for a campaign. Campaign planning embodies the commander's strategic vision for the arrangement of related operations necessary to attain theater strategic objectives. Portions of this process are often delegated to components, which create plans to support the combatant commander's vision. **The air component contribution to campaign planning is the JAOP.** This planning may take place independently or in support of deliberate planning and crisis action planning.

- **Deliberate planning** encompasses the preparation of plans that occur in non-crisis situations. It is used to develop campaign and contingency plans for a broad range of activities based on requirements identified in the Guidance for Employment of the Force, Joint Strategic Capabilities Plan, or other planning directives. Deliberate planning underpins and facilitates the transition to crisis action planning.

- **Crisis action planning** provides the Chairman, Joint Chiefs of Staff and combatant commanders a process for getting vital decision-making information up the chain of command to the President and Secretary of Defense. It also outlines the mechanisms for monitoring the execution of the operation. CAP encompasses the activities associated with the time sensitive development of operation orders for the deployment, employment, and sustainment of assigned, attached, and allocated forces and capabilities in response to a situation that may result in actual military operations. CAP procedures provide for the rapid and effective exchange of information and analysis, the timely preparation of military COAs for consideration

by the President or Secretary of Defense, and the prompt transmission of their decisions to the joint planning and execution community (JPEC).

These three processes are interrelated. All three may be conducted at different times for a given contingency and products created in one process are often used in others. Campaign planning bridges the strategic objectives to operational objectives and tactical tasks through the targeting process.

The JAOP is created through the seven step JOPPA and is normally developed in support of the JFC's plan or order. Almost all targeting support to pre-conflict planning is accomplished through the JOPPA. The targeting intensive JOPPA steps are discussed below.

JOPPA AND TARGETING

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Initiation. The commander, Air Force forces (COMAFFOR) and staff performs an assessment of the initiating directive to determine time available until mission execution, current status of intelligence products, and other factors relevant to the specific planning situation.

Mission Analysis. During this stage, joint intelligence preparation of the operational environment (JIPOE) begins. In order to fully support an effects-based campaign, the intelligence community should conduct robust JIPOE to inform planning. JIPOE provides a comprehensive framework for Intelligence, surveillance, and reconnaissance (ISR) support to planning and COA selection. Consequently, JIPOE should assist commanders in anticipating enemy intent and enable them in pre-empting enemy actions. The JIPOE process continues throughout planning by examining adversary and friendly capabilities, adversary intent, and the operational environment. Enemy and friendly centers of gravity (COG) are also identified during this initial stage of the JOPPA. As mission analysis is refined through later stages of the JOPPA, enemy COGs are analyzed, yielding critical vulnerabilities or other key system nodes. These are further examined through target system or nodal analysis to yield target sets, targets, critical elements, and aimpoints, as well as commander's critical information requirements (CCIRs) to support tactical assessment. Such analysis carries a considerable information-flow cost. In order to properly identify collection and exploitation requirements for targeting, **target system analysis (TSA) and or targeting effects studies should begin well in advance of operations and should continue throughout them.** It should begin during the initial stages of JIPOE and draw upon as much ongoing peacetime intelligence/targeting material as is available for the theater or area of operations. JIPOE, TSAs and target development should also ensure integration of specialized analysis in support of space, cyberspace, and information operations.

COA Development. JIPOE is refined during this stage and includes detailed analysis of COGs identified during mission analysis. COG analysis is important to targeting efforts because it identifies the enemy's sources of power and will to fight and tries to discover how and where those sources of power are vulnerable, where critical nodes within them are, and how they can be exploited by the full capabilities of the joint force (e.g., air, space, cyberspace, information operations, etc.). Critical vulnerabilities can

be difficult to pick from critical requirements or to translate those vulnerabilities into explicit target sets. Techniques for translating vulnerabilities into targets can be used as the foundation for development of COAs or a selected COA may be directed by the JFC.

Plan or Order Development. This step and its ultimate product, the JAOP, describe how air component may support the JFC's operational plan. The JAOP identifies objectives, desired effects, targets, and assessment measures in as much detail as available time and intelligence allow. Objectives and the end state are derived from commander's guidance, strategy development and planning. Targeting efforts should always aim toward achieving these objectives and the end state. During JAOP development, deliberate targeting is used to develop targets and target sets included in the JAOP and its attachments. Even if targeting information developed during planning is not included in the JAOP or its attachments, JAOP development may require considerable targeting effort in order to validate selected COAs, CONOPS, and other elements of the plan. Commanders and planners should know, at least approximately, how much effort and what resources are required to achieve the operation's desired effects. This knowledge can be gained by conducting some (at least notional) deliberate targeting systems analysis using existing TSA products, targeting databases, and/or assessment of the total number of potential targets within modern integrated database (MIDB) before the conflict begins. Target selection should be based upon desired effects against enemy COGs, which in turn should be based upon the objectives for the conflict.

The JAOP should be effects-based. It is the air component's main source of guidance. Targeting efforts play a major role in building an effects-based JAOP by relating effects to particular targets and target systems and helping validate whether planned resources can achieve those effects.

The JAOP should provide broad guidelines for prioritizing targets/target systems, as well as making clear which categories or sets are most important to the campaign. The JAOP should also provide guidance on the sequencing of targeting actions or effects, which is not the same thing as priority. Although parallel effects are generally best, sometimes some targets should be attacked first to enable effects against other targets. The JAOP, as well as subsequently published special instructions (SPINS), AOD, and ATOs, should clearly articulate the commander's rules of engagement (ROE) that ensure operations comply with the law of armed conflict (LOAC).

Finally, the JAOP should establish guidelines for dynamic, especially time-sensitive, targeting. Dynamic targeting is one of the most labor-intensive and intellectually demanding challenges the air component faces. Anticipating as much of the challenge as possible and spelling out guidance and priorities in the JAOP may ease the burden on commanders and air operations center (AOC) combat operations division (COD) personnel once the daily battle rhythm begins.[1] This may prevent mistakes from being made during employment or may at least mitigate their impact. Planners should

[1] See Air Force Instruction 13-1 AOC, Volume 3 for an expanded discussion on AOC divisions and teams.

address as broad a scope as possible in as much detail as time and planning resources allow. This should include robust ROE and related legal considerations (see Appendix A).

DELIBERATE TARGETING

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Deliberate targeting provides a systematic analytical approach that focuses targeting efforts on supporting operational requirements and the commander's objectives. It helps focus the appropriate capabilities against adversary targets at the right time and place to impose specific desired effects that achieve joint force objectives. **Deliberate targeting supports the air tasking cycle, which creates a daily conveyance of the overall air component strategy. Deliberate targeting within the tasking cycle is the means Airmen use to accomplish the COMAFFOR's non-dynamic targeting requirements.** Therefore, this section discusses deliberate targeting within the context of the air tasking cycle. The air tasking cycle develops the products needed to build and execute an ATO and accomplish assessment. Although it is presented below as six separate, sequential phases, in reality **the targeting process is bi-directional, iterative, multi-dimensional, sometimes executed in parallel, and part of a larger set of processes.** It is built on a foundation laid by thorough JIPOE. Participants from the AOC's strategy, ISR, plans, and operations divisions accomplish various targeting responsibilities, integrating their products into all levels and stages of the air tasking cycle

The cycle consists of the following phases performed at various levels of command:

✪ Objectives, effects, and guidance.

✪ Target development.

✪ Weaponeering and allocation.

✪ ATO production and dissemination.

✪ Execution planning and force execution.

✪ Assessment.

The tasking cycle has usually been represented as a set of distinct processes that separately accomplish targeting, apportionment and allocation of joint air capabilities to produce the ATO. In fact, these processes are all closely interrelated, regarding them as distinct entities misses the central insight that they should work together as an integrated whole, if targeting and tasking are to be most effective. **Targeting and ATO**

production are essential to the tasking cycle. Although the targeting and tasking cycles perform separate and distinct functions, they are highly intertwined and require close coordination, the two cycles run almost in parallel. Once a daily battle rhythm is established the tasking cycle as a whole encompasses the entire process of taking commander's intent and guidance; determining where to apply force or other actions to fulfill that intent, matching available capabilities and forces with targets, putting this information into an integrated, synchronized, and coordinated order, distributing that order to all users, monitoring execution of the order to adapt to changes in the operational environment, and assessing the results of that execution. The cycle is built around finite time periods required to plan, integrate, coordinate, prepare, conduct, and assess air operations. These time periods may vary from theater to theater, but **the tasking cycle and its constituent processes drive the AOC's battle rhythm and thus helps determine deadlines and milestones for related processes, including targeting.**

A principal purpose of the air tasking cycle is to produce orders and supporting documentation to place a flexible array of capabilities in a position to create desired effects in support of the commander's intent. This cycle is driven by the tyranny of time and distance. It takes time for ground crew to prepare aircraft for flight, for aircrew to plan missions, and for aircrew to fly to the immediate theater of operations from distant airfields. Likewise, commanders should have enough visibility on future operations to ensure sufficient assets and crews are available to prepare for and perform tasked missions. These requirements drive the execution of a periodic, repeatable tasking process to allow commanders to plan for upcoming operations. The ATO execution period (usually 24 hours in duration) and the preceding process during which the ATO is developed (usually 72-96 hours in duration) are a direct consequence of these physical constraints.

In contrast to the misperception that targeting information should be provided to planners 72-96 hours in advance; it is evident targets can actually be struck in minutes from when information is made available in the dynamic targeting process. The key to both the flexibility and versatility of deliberate and dynamic targeting is a shared understanding among the functional components. Misperceptions may arise because other components may not have visibility on the wide variety of missions tasked to the air component in support of the JFC's operation and because air component assets are often tasked to simultaneously conduct missions supporting overlapping operational phases. This important shared understanding is largely accomplished by ensuring component liaisons are properly positioned during planning and execution.[1]

The ATO conveys tasking for joint air operations for a specific period of time, normally 24 hours. Detailed planning generally begins 72 hours prior to the start of execution to properly assess the progress of operations, anticipate enemy actions, make needed adjustments to strategy, and enable integration of all components' requirements. The actual length of the tasking cycle may vary from theater to theater.

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[1] See Air Force Instruction 13-1 AOC, Volume 3 for a description of the AOC other service/functional component liaisons.

The tasking cycle length may be based upon JFC guidance, air component commander direction, and theater needs. The length should be specified in theater standard operating procedures or other directives. If it is modified for a particular contingency, this should be specified in JFC's operation plan (OPLAN) or the air component's JAOP. The net result of this part of the tasking cycle—and of deliberate targeting efforts—is that there are usually five ATOs in various stages of progress at any one time.

- ✪ One, or more, previously executed ATO undergoing assessment at various levels.
- ✪ Current ATO in execution.
- ✪ Next ATO in production.
- ✪ Next successive ATO in detailed planning (target development and weaponeering).
- ✪ Following successive ATO in strategy development (objectives and guidance).

Some assets may not operate within the established cycle. These include most space assets, which are tasked via the joint space tasking order (JSTO); cyberspace assets, which are tasked via the cyber tasking order (CTO); and airborne information operations (IO) assets, which are tasked via the ATO. However, some theater-specific space and cyberspace operations may be included in the daily ATO for the sake of situational awareness, integration, and synchronization. During major conventional operations, special operations function within a 96-hour planning cycle; however, during contingency operations they often operate within or drive the dynamic targeting process. Certain IO and other nonlethal capabilities operate within a 96-hour cycle as well, and it is critical for AOC planners to know if special operations forces (SOF) and IO personnel may assist with targeting. Intertheater air mobility assets also do not necessarily operate within the tasking cycle. In large operations, the existence of differing planning cycles among components can lead to increased complexity in the process. Most component planning cycles are approximately 72-96 hours. However, the requirement within the air tasking cycle to manage as many as five separate ATOs drives the requirement for discipline to manage defined inputs and outputs during particular slices of time.

Deliberate targeting supports every phase of the JOPPA and the joint air tasking cycle. It is interwoven throughout the phases up to and including ATO production and dissemination. Effective deliberate targeting comes at a high cost in terms of the volume and flow of information. Targeting and assessment, which are integrally related, impose most of the intelligence collection burden the joint force carries—to support deliberate targeting efforts before, dynamic targeting efforts during, and assessment during and after ATO execution. Successful targeting requires in-depth information on such things as enemy force posture; capabilities and movement; tactics, techniques, and procedures (TTPs); COGs and target vulnerabilities; enemy leadership's intentions, habits, and movement patterns; the flow and interconnections of enemy economic behavior; and the linkages and interconnections within major infrastructure systems, like electrical power and electronic communications webs. The process also takes into account such things as friendly objectives, concept of operations (CONOPS), ROE,

target time constraints, and friendly force capabilities to create five general types of products:

- ✪ Target nominations and target lists intended to achieve desired effects which will accomplish commander's objectives while complying with the published guidance for the use of forces.
- ✪ Capability recommendations based upon effects chosen to achieve commander's objectives.
- ✪ Capability effectiveness estimates logically linked to effects specified during target development to support force application recommendations (may also include commensurate collateral damage estimates for targets of concern).
- ✪ Force/capabilities selection and planning.
- ✪ Target materials built to support current and future targeting efforts.

Once the ATO is published, adjustments are made in the COD and targeting decisions are handled through dynamic targeting. The final phase of the cycle is assessment, which is closely tied to ISR and may lag established battle rhythms and timelines due to its heavy dependence on planning and direction, collection, processing and exploitation, analysis and production, and dissemination. It is accomplished primarily by the ISR Division and the operational assessment team (OAT) within the Strategy Division (SD).[2]

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[2] See Air Force Instruction 13-1 AOC, Volume 3 for an expanded discussion on AOC divisions and teams.

DYNAMIC TARGETING

Last Updated: 10 Jan 14

Dynamic targeting complements the deliberate planning efforts, as part of an overall operation, but also poses some challenges in the execution of targets designated within the dynamic targeting process. Dynamic targets are identified too late, or not selected for action in time to be included in deliberate targeting**.** The doctrine of a deliberate targeting process controlled by strategy, law of armed conflict (LOAC), and rules of engagement (ROE), etc. is equally applicable to the dynamic targeting process.

Also by definition, dynamic targeting occurs in a much more compressed timeline, requiring special consideration and attention for all personnel assigned to work the dynamic targeting process. The importance of dynamic targeting is further emphasized by joint targeting doctrine. While not the sole domain of the commander, Air Force forces (COMAFFOR), Airmen are heavily involved in the planning and execution of the dynamic targeting. The joint force commander (JFC) ultimately designates the responsibilities and authorities associated with the prosecution of dynamic targets and may often designate specific component responsibilities, based on location, capability, or target types.

Dynamic targeting is a term that applies to all targeting that is prosecuted outside of a given day's preplanned air tasking order (ATO) targets (i.e., the unplanned and unanticipated targets). It represents the targeting portion of the "execution" phase of effects-based approach to operations (EBAO). It is essential for commanders and air operations center (AOC) personnel to keep effects-based principles and the JFC's objectives in mind during dynamic targeting and ATO execution. It is easy for those caught up in the daily battle rhythm to become too focused on tactical-level details, losing sight of objectives, desired effects, or other aspects of commander's intent. When this happens, execution can devolve into blind target servicing, unguided by strategy, with little or no anticipation of enemy actions.

Dynamic targeting is different from deliberate targeting in terms of the timing of the steps in the process, but not different in the substance of the steps. Ultimately, dynamic targets are targets—as such, their nomination, development, execution, and assessment still takes place within the larger framework of the targeting and tasking cycles. Some are fleeting and require near-immediate prosecution if they are to be targeted. Such targets require a procedure that can be worked through promptly and

that facilitates quick transition from receipt of intelligence ("trigger events") through targeting solution to action against the target. This compressed decision cycle is best handled through the specialized dynamic targeting sub-processes. Seen from the larger cycle's perspective, dynamic targeting takes place within phases five (execution planning and force execution) and six (assessment) of the targeting and air tasking cycles. The earlier phases serve to provide commanders' targeting guidance and determine concept of operations (CONOPS) for making the resources that may prosecute dynamic targets available. Ultimately, the JFC and COMAFFOR should make decisions about these targets based on critical and timely intelligence information and may likely require reallocation of resources that could impact ongoing deliberate plan execution.

The combat operations division (COD) is responsible for implementation of dynamic targeting for the ATO currently in execution.[1] Successful dynamic targeting, however, requires a great deal of prior planning and coordination with other divisions within the AOC and with other components based on the type of target. If dynamic targeting is to be done correctly, planners should develop a plan that makes assets available to the COD prior to the start of execution. This can be done in a number of ways but the most common methods are:

- Preplanning target reference methods and coordination measures such as kill boxes and combat area entry points/routes for cruise missiles.

- Preplanning on-call or pre-positioned strike and intelligence, surveillance, and reconnaissance (ISR) packages (including tanker support) for rapid response to emerging targets (such as on-call electronic warfare, space, cyberspace operations, interdiction, or close air support missions available for tasking during ATO execution; missions on ground alert; and/or air-to-ground weapons loaded on aircraft performing defensive counterair missions).

- Using joint intelligence preparation of the operational environment (JIPOE) to determine the most probable areas where targets may emerge during execution.

- Diverting airborne assets assigned to lower priority targets to strike the recently identified target.

- Coordinating and synchronizing dynamic targeting operations by streamlining procedures.

- Developing procedures for rapid handover of the mission tasking to another component for mission execution, if the air component cannot attack an emerging target.

Divisions other than the COD have important roles to play in dynamic targeting. The strategy division (SD) should capture macro-level targeting guidance to include

[1] See Air Force Instruction 13-1 AOC, Volume 3 for a description of the AOC other service/functional component liaisons.

component priorities in the air operations directive (AOD). Many items in the AOD, like commander's intent, anticipated weapons available, ROE, acceptable risk levels, and elements of the ISR collection plan provide vital information needed by operators and targeteers to develop and implement effective and timely effects based responses. For instance, ROE are especially important to this form of time-compressed targeting. While the SD typically drafts ROE inputs with advice from the judge advocate general, all involved in planning and execution should clearly understand the ROE. Compliance with ROE is a shared responsibility between the COMAFFOR staff, subordinate command elements, and aircrews/operators. Due to the probable time-sensitive nature of targets prosecuted during execution, clear guidance should be developed to enable rapid prosecution. Planning personnel may need to convey the priority of the dynamic target planned for engagement in terms relative to the target planned for deliberate execution that may not be engaged due to the reprioritization. In that same light, the priority of the ISR asset that may provide assessment information on that target should also be addressed, especially if there may be a dynamic change to the ongoing joint integrated prioritized collection list (JIPCL) missions.

Liaison officers (LNOs) from coalition partners, other components, and other Services are essential during dynamic targeting. LNOs—particularly the special operations liaison element (SOLE), battlefield coordination detachment (BCD), and other government agencies—may be able to provide the COMAFFOR with additional options for dealing with emerging targets as well as provide locations and activities of friendly forces. LNOs work de-confliction issues and their forces may also assist friendly forces by finding, fixing, tracking, targeting, and assessing targets.
As stated earlier, dynamic targeting occurs in a much compressed timeline. Successful prosecution of a target may require that targeting be completed in minutes. To achieve this time compression, the COMAFFOR should consider implementing procedures that enable the phases of dynamic targeting to be performed simultaneously rather than sequentially. Ideally, one COD team should perform targeting of all dynamic targets. Creating separate teams may result in unwanted isolation, impede unity of effort, and inhibit the cross-flow of information.

Successful prosecution of targets during execution also requires well organized and well-rehearsed procedures. There is a need for sharing sensor data and targeting information, identify suitable strike assets, obtain mission approval, and rapidly deconflict weapon employment. The reaction time between the sensor and shooter can be greatly accelerated if there are clearly articulated objectives, guidance, priorities, and intent for dynamic targeting before targets are even identified. The appropriate response for each target depends heavily on the level of conflict, the clarity of guidance to define the desired outcome, and ROE.

DYNAMIC TARGETING AND THE TASKING PROCESS

Last Updated: 10 Jan 14

Dynamic targeting includes prosecution of several categories of targets:

- JFC-designated time sensitive targets (TST) — targets or target sets of such high importance to the accomplishment of the JFCs mission and objectives, or one that presents such a significant strategic or operational threat to friendly forces or allies, that the JFC dedicates intelligence collection and attack assets, or is willing to divert assets away from other targets in order to engage it.
- Targets that are considered crucial for success of friendly component commanders' missions, but are not JFC-approved TSTs. Component commanders may nominate targets to the JFC for consideration as TSTs. If not approved as TSTs by the JFC, these component-critical targets may still require dynamic execution with cross-component coordination and assistance in a time-compressed fashion.
- Targets that are scheduled to be struck on the ATO being executed but have changed status in some way (such as fire support coordination measures changes).
- Other targets that emerge during execution that friendly commanders deem worthy of targeting, prosecution of which may not divert resources from higher-priority targets.

Each of the four categories of targets specified is prosecuted via the same dynamic targeting portion of the tasking process—they differ only in relative priority.

Combat Identification (CID) plays an important part in dynamic targeting. For prospective targets, there are essentially three levels of CID that are relevant to AOC personnel and those tasked to carry out actions against them. At the first level, the track or entity is identified as friendly, foe, or neutral. At the next level, the prospective target's type of platform is identified. This may aid in determining the nature of tactical action required and assist in prioritizing the target. Finally, a third level entails determining the prospective target's intent (as by its track relative to friendly forces) when possible. This should further aid in establishing the prospective target's priority, and may sometimes entail reclassifying a target as a TST based on its potential threat to friendly forces.

Dynamic targeting consists of six distinct phases: find, fix, track, target, engage, and assess (F2T2EA).

These are the same phases used to prosecute joint TSTs, as explained in the *Multi-Service Tactics, Techniques, and Procedures for Dynamic Targeting* (AFTTP 3-2.3). This method referred to as F2T2EA or colloquially as the "kill chain." Each phase is discussed below.

Find. The find phase involves detection of an emerging target, which various aspects of its characterization will result in it being binned into one of the dynamic targeting categories listed above. The find phase requires clearly designated guidance from commanders, especially concerning target priorities, and the focused ISR collection plan based on JIPOE, to include named areas of interest and target areas of interest. Following this collection plan leads to detections, some of which may be emerging targets, that meet sufficient criteria (established by the AOC with commander's guidance) to be considered and developed as a target. The time sensitivity and importance of this target may be initially undetermined. Emerging targets usually require further ISR and analysis to develop and confirm.

Commanders should not task sensors without an idea of what they may collect. They should anticipate results, not request unfocused detection. The result of the find phase is a potential target that is nominated for further investigation and development in the fix phase.

Fix. The fix phase positively identifies an emerging target as worthy of engagement and determines its position and other data with sufficient fidelity to permit engagement. When the emerging target is detected, sensors are focused upon it to confirm its identity and precise location. This may require implementing a sensor network or diverting ISR assets from other uses to examine it. The COMAFFOR may have to make the decision on whether diversion of ISR resources from the established collection plan is merited, but this decision can often be made by COD personnel. Data correlation and fusion confirms, identifies, and locates the target, resulting in its classification in one of the four target categories listed above. Target location and other information should be refined enough to permit engagement in accordance with ROE. An estimation of the target's window of vulnerability frames the timeliness required for prosecution and may affect the prioritization of assets and the associated risk assessment.

If a target is detected by the aircraft or system that may engage it (for example, by an armed remotely piloted aircraft, or platform with an advanced targeting pod), this may result in the find and fix phases being completed near-simultaneously, without the need for additional ISR assets. It may also result in the target and engage phases being completed without a lengthy coordination and approval process. Battle management systems [i.e., airborne warning and control system (AWACS) and joint surveillance target attack radar system (JSTARS) aircraft] can often fix target locations precisely enough to permit engagement without the need for further ISR collection. Growth in sensor technology has permitted "non-traditional" sources of ISR to supplement the find, fix, and track phases. Integrating data from platforms other than those traditionally dedicated to intelligence collection, to include information gleaned from weapons

systems or even munitions themselves, helps to build a common operating picture that commanders can use to shorten the F2T2EA cycle.

Track. The track phase takes a confirmed target and its location, maintaining a continuous track. Sensors should be coordinated to maintain situational awareness and track continuity on targets. Windows of vulnerability should be updated when warranted. This phase may require re-prioritization of ISR assets, just as the fix phase may, in order to maintain situational awareness. If track continuity is lost, it may be necessary to re-accomplish the fix phase—and possibly the find phase as well. The track phase results in track continuity and refining the target identification. This is maintained by appropriate sensors or sensor combinations, a sensor prioritization scheme (if required), and updates on the target's window of vulnerability (if required). The process may also be run partially "in reverse" in cases where an emerging target is detected and engaged. Once it becomes clear that it is a valid target, the sensors detecting it can examine recorded data to track the target back to its point of origin, such as a base camp. This could potentially identify threats or more lucrative targets. Such *point of origin hunting* has proven especially useful during stability and counterinsurgency operations such as those in Iraq and Afghanistan.

Target. The target phase takes an identified, classified, located, and prioritized target; determines the desired effect and targeting solution against it; and obtains required approval to engage. During this phase, COD personnel should review target restrictions, including collateral damage, ROE, LOAC, the no strike list (NSL), the restricted target list (RTL), and fire support coordination measures (FSCM). In essence, the targeting and operational members of the COD must accomplish all facets of the "target validation" process. This phase also accomplishes effects validation, weaponeering/capabilities analysis, and collateral damage estimation (CDE) analysis. COD personnel match available strike and sensor assets against desired effects, then formulate engagement options. They also submit assessment requirements.

The selection of assets for a specific target may be based on many factors, such as the location and operational status of ISR and strike assets, support asset availability, weather conditions, ROE, target range, the number and type of missions in progress, available fuel and munitions, the adversary threat, and the accuracy of targeting acquisition data. This can be the lengthiest phase due to the large number of requirements that should be satisfied. In many cases, however, dynamic targeting can be accelerated if target phase actions can be initiated and/or completed in parallel with other phases.

Engage. In this phase, identification of the target as hostile is confirmed and engagement is ordered and transmitted to the pilot, aircrew, or operator of the selected weapon system. The engagement orders should be sent to, received by, and understood by the operator of the weapons system. The engagement should be

monitored and managed by the engaging component (for the air component, by the AOC).[1] The desired result of this phase is successful action against the target.

Assess. In this phase, predetermined assessment requests are measured against actions and desired effects on the target. ISR assets collect information about the engagement according to the collection plan (as modified during dynamic targeting) and attempt to determine whether desired effects and objectives were achieved. In cases of the most fleeting targets, quick assessment may be required in order to make expeditious re-attack recommendations.

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[1] "Recent operations have caused some to perceive an apparent disconnect regarding the Airman's stated preference for decentralized execution. Airmen should not misconstrue a given situation with what the Air Force generally believes about decentralized execution. Discipline demands that senior leaders resist the temptation to get involved with execution decisions that are normally best left to subordinate commanders and forward decision makers" (Volume 1).

DYNAMIC TARGETING AND NONLETHAL EFFECTS

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The F2T2EA kill chain applies equally to the application of military capabilities to achieve lethal/nonlethal effects through other means, such as information operations, airdrop, space-based targeting or directed energy. The decision to employ these capabilities is based on their availability, desired effects, potential consequences, and the JFC's guidance.

DYNAMIC TARGETING ENGAGEMENT AUTHORITY

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The authority to engage should be delegated to the C2 node that has the best information or situational awareness to execute the mission and direct communications to the operators and crews of the weapon systems involved. If the COMAFFOR is delegated TST engagement authority by the JFC, that commander may delegate his engagement authority to a lower level (e.g., AOC director or chief of the combat operations division). The COMAFFOR has the authority to redirect those forces over which he has operational or tactical control. For all others, the affected component commander should approve all requests for redirection of apportioned air assets. Components execute the ATO as tasked and recommend changes to the AOC as appropriate, given emerging JFC and component requirements.

Functional commands like US Cyber Command (USCYBERCOM) and Joint Functional Component Command-Space (JFCC-Space) may have operational and tactical control of some functional capabilities. In such cases, coordinating authorities at the JFC and/or component level should be authorized to plan, coordinate, integrate, and execute their respective functional capabilities within the operational area. Coordination requirements associated with these functional capabilities may result in long-lead times that should be considered within the AOC planning and execution processes.

At the tactical level, engagement authority normally resides with the “shooter” (aircrew, system operator, etc.) for those planned events on the current tasking order being executed; this follows the tenet of decentralized execution. The fact that planned missions on an ATO have been approved for release by the COMAFFOR passes engagement authority to the “shooters” personally executing those ATO missions, who should adhere to all guidance included in the ATO [special instructions (SPINS), airspace control order (ACO), ROE, etc.]. In dynamic targeting situations, where the target is not specified in the ATO prior to takeoff or execution, engagement may require that the “shooter” be “cleared to target” from a C2 entity outside the AOC like JSTARS, AWACS, tactical air control party (TACP), and forward air controllers (ground or airborne) due to identification or other restrictions required prior to attack.

Engagement authority for those events that the AOC maintains control over may be passed to crews, via the Theater Air Control System (TACS), with required criteria to be met for weapon release, when appropriate. Engagement authority for certain sensitive

targets may reside at a higher level than the JFC and should be passed appropriately through the component commander when the situation dictates.

Placing the appropriate level of battle space awareness at subordinate C2 nodes can streamline the C2 cycle and allow timely engagement during dynamic targeting. Decentralized C2 nodes will exchange target information (type, classification identification, location, etc.) through common data links (e.g., Link 16, UHF, wide area networks, etc.) with a fidelity that permits them to operate as a single, integrated C2 entity in order to effectively perform decentralized, coordinated execution of time-sensitive attacks.

DYNAMIC TARGETING RISKS

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Understanding the level of acceptable risk is critical to successful targeting during execution. With compression of the decision cycle comes increased risk due to insufficient time for the more detailed coordination and deconfliction that takes place during deliberate targeting. Commanders should assess risk early, determine what constitutes acceptable risk, and communicate their intent. JFC guidance may stipulate acceptable risk when engaging TSTs, if not, then the COMAFFOR should seek to obtain it. When new targets are acquired, Airmen in the AOC and in the field should rely on commanders' guidance, ROE, and their own experience to assess acceptable risk.

Particular targets may be determined to be such a threat to the force or to mission accomplishment that the COMAFFOR may accept a higher level of risk in order to attack the target immediately upon detection. Items to be considered in the risk assessment include:

- Risk of potential fratricide, risk to non-combatants, and collateral damage potential.
- LOAC and ROE compliance.
- Increased risk to attacking forces due to accelerated planning and coordination.
- Redundant attacks and wasting limited resources.
- Accepted use of non-optimum capabilities and potentially limited effects.
- Opportunity costs of diverting assets from their planned missions.

These considerations should be balanced against the risk of not attacking the target in time and thus risking mission failure, harm to friendly forces, or losing the opportunity to strike the target. More commonly, the risk associated with dynamic targeting involves the trade-off of diverting ISR and strike assets from already-scheduled missions to emerging targets. This should only be done when commanders' priority given to the new target exceeds that of the old. However, proper planning for on-call assets can mitigate much of this opportunity cost.

CHANGES DURING DYNAMIC TARGETING

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The COD should be ready to respond with new targeting information in order to provide seamless operations when changes occur. These include:

- Responding to changes in friendly operations. For instance, if an aircraft that was tasked to prosecute a target has to abort for maintenance reasons, the COD should know the target's relative priority in order to provide appropriate targeting guidance. If the target is low priority, it may be best to place it on a subsequent day's ATO. If it is of higher priority, COD personnel may determine how best to direct or divert resources to prosecute it. COD personnel may have the best picture of what resources are available to prosecute it and what diverting resources may cost. Likewise, if an aircraft or package is diverted to prosecute a TST, the COD should identify the target(s) which may no longer be struck, as well as the new target which may be attacked. This information should be passed to the targeteers and collection managers to ensure coordinated collection and assessment on these new targets.

- Responding to changes in weather. A target planner's actions may be similar to when he responds to changes in friendly operations. Further, changes in weather may require changes to the platforms and/or weapons required to engage a particular target. Target planners should ensure that the AOC weather specialty team is engaged.

- Re-targeting. If a target that was to be prosecuted is no longer a viable target for whatever reason, targeteers should have alternate targets to assign to a strike mission. Time is important because assets may already be airborne.

- Responding to TSTs. When a TST is identified, the COD should decide the best time to engage it. COD targeteers are involved in these efforts and provide guidance to planners concerning the characteristics and vulnerability of the target. Targeteers should be familiar with possible targets so that quick assessments and guidance can be given before the window of opportunity to strike the TST is gone.

DYNAMIC TARGETING LIMITATIONS

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Dynamic targeting has two significant limitations compared with deliberate targeting: the lack of detailed capability analysis and increased threat exposure. Commanders and the COD should consider these limitations when deciding whether to prosecute a target using dynamic targeting methods.

- Capability Analysis. Due to the reduced planning time available, targets prosecuted using dynamic targeting may be engaged with less consideration given to key employment issues such as fuse settings or axes of attack. In some cases, assets may be diverted to prosecute these targets with munitions that are not optimum for the given task. Since these considerations may carry increased risk of mission failure, collateral damage, or even harm to friendly troops, commanders should weigh the potential benefits gained by prosecuting the target quickly. COD personnel should work with their targeteers to ensure that proposed capability analysis solutions are sufficient for the given task.

- Increased Threat. Denied environment targets are normally attacked by packages with dedicated support, such as electronic jamming and suppression of enemy air defense capabilities. The shortened dynamic targeting planning window may not allow for the same level of support, thereby exposing aircrews to greater risk. Time for target area threat analysis is also reduced, further increasing risk to aircrews and weapon survivability.

ANNEX 3-60 TARGETING

TARGETING AND THE AIR TASKING CYCLE

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The air tasking cycle is the COMAFFOR's process for effective and efficient employment of joint air capabilities. It is a methodical, iterative, and responsive process that translates operational level guidance into tactical level plans. The air tasking cycle promotes flexibility and versatility with a series of Air Tasking Orders (ATOs) and related products in progress at any time and by responding during execution to changes in the operational environment. The air tasking cycle consist of the following stages:

- Objectives, Effects, and Guidance
- Target Development
- Weaponeering and Allocation
- ATO production and Dissemination
- Execution Planning and Force Execution
- Assessment

The air tasking cycle and joint targeting cycle are separate yet intregrally related processes.

ANNEX 3-60 TARGETING

OBJECTIVES, EFFECTS, AND GUIDANCE

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Purpose of the Phase. Clear understanding of the commander's objectives and guidance is essential for effective tasking and targeting. Objectives are the clearly defined, decisive, attainable, and measurable goals toward which every military operation should be directed. They provide focus for those at all stages of the tasking cycle and give targeting personnel the overarching purpose for their efforts. Guidance sets limits and boundaries on the objectives and how they are attained. It establishes constraints—things we *must* do—and restraints—things we *must not* do. Together, the two embody commander's intent for military operations.

This phase starts with joint force commander (JFC) guidance to the joint force components. The JFC consults with his component commanders, decides on modifications to their courses of action (COAs) or schemes of maneuver, and issues guidance and intent. This may occur through the efforts of the joint targeting coordination board (JTCB). The JTCB provides a forum in which all components can articulate strategies and priorities for future operations to ensure that they are synchronized and integrated. The JTCB normally facilitates and coordinates joint force targeting activities with the components' schemes of maneuver to ensure that the JFC's priorities are met. Accordingly, the commander, Air Force forces (COMAFFOR) should issue further guidance on the specific scheme of maneuver Additionally, **the JFC should delegate authority to conduct execution planning, coordination, and deconfliction associated with joint air component tasking to the COMAFFOR and should ensure that this process is a joint effort.** The COMAFFOR should possess a sufficient C2 infrastructure, adequate facilities, readily available joint planning expertise, and a mechanism for accomplishing targeting, weaponeering, and assessment. The air operations center (AOC) provides the COMAFFOR with these capabilities.

The JFC determines whether a JTCB will be held and defines its role. The JTCB should cover four broad topics:

- Assessment of campaign progress since the last meeting (usually the last 24 hours), with recommendations for future action.
- Broad guidance for the next 72 hours issued by the JFC.

- ✪ Major operations (schemes of maneuver) over the next 48 hours, briefed by each of the components.
- ✪ Macro-level review and guidance on joint maneuver and fires [including, especially, targeting and intelligence, surveillance, and reconnaissance (ISR) priorities] over the next 24 hours, to help guide joint dynamic targeting efforts for the upcoming execution period.

The COMAFFOR should prepare prior to the JTCB by consulting with senior component liaisons and the staff to determine what modifications are needed to the air scheme of maneuver and to determine the air apportionment recommendation for the JFC's approval.

Once battle rhythm starts, the apportionment period is usually 24 hours. The apportionment recommendation can be approved as part of the JTCB or separately after it. Once approved, the apportionment decision should be included in the ultimate product of this phase, the air operations directive (AOD). In deriving guidance that may be considered at the JTCB and published in the AOD, the COMAFFOR is supported by the AOC strategy divisions (SD)[1] strategy plans and strategy guidance teams. The strategy guidance team is primarily responsible for producing the AOD. The SD should also ensure the cyber operations directive and space operations directive (SOD) are fully integrated and synchronized with the AOD produced by the AOC.

The objectives, effects, and guidance phase is also where effects and their accompanying measures of effectiveness (MOE) **and measures of performance** (MOP) **are determined.** Strategy guidance and strategy plans teams work closely with the CPD targeting effects team (TET), and the ISR division (ISRD) to determine effects that achieve the stated objectives, select appropriate measures and indicators for assessment, and determine ISR requirements to collect against the MOEs. Results of this effort may be published as lists of tasks or desired effects in the AOD.

Finally, considerations of the law of armed conflict (LOAC) and rules of engagement (ROE) for the conflict may directly affect all phases of the tasking process (and thus targeting). Targeteers should understand and be able to apply the basic principles of these disciplines as they relate to targeting. See Appendix A for further discussion of LOAC and ROE.

Products of the Phase. The AOC SD drafts the **air operations directive** (AOD) for COMAFFOR approval. In a normal battle rhythm, this is done on a daily basis. The AOD is the vehicle for the COMAFFOR to express his intent for a specific day and communicate the JFC's apportionment decision. Apportionment guidance should reflect prioritized operational objectives and relevant tactical tasks with approximate weights of effort for each objective. Specific weights of effort should be avoided due to the difficulty in precisely measuring effects of air, space, and informaton operations (IO), and to allow maximum flexibility in planning the application of airpower. However, the

[1] See Air Force Instruction 13-1 AOC, Volume 3 for an expanded discussion on AOC divisions and teams.

CPD can use these weights of effort, along with existing friendly force capabilities, to estimate the numbers of aimpoints by effect or objective to focus target development.

The prioritized tasks in the AOD should be effects-based and reflect commander's guidance and intent. By crafting effects-based tasks for the AOD, target developers within the AOC's ISRD gain the flexibility to identify and nominate the most effective means to achieve the desired effects. Tasks that are not effects-based are often target-based, meaning that there is little flexibility in the selection of targets,

The JIPTL and JFACC/COMAFFOR Responsibilities

Just as joint doctrine describes the option for the JFACC to serve as the Airspace Control Authority and Area Air Defense Commander, the JFACC/COMAFFOR should be delegated authority to approve the JIPTL as the JFC's representative. Accomplished in full view and in coordination with all components, this arrangement yields efficiencies by locating the JIPTL approval process with the targeting expertise resident within the AOC and potentially eliminating the requirement for a JTCB. Alternatively, similar efficiencies can be gained by appointing the JFACC/COMAFFOR chair of the JTCB vice a member to the JFC staff.

and can lead to the inefficient use of scarce airpower resources. **The AOD is the primary vehicle for communicating desired effects to target developers and others involved in targeting on a daily basis.** Detailed, logical lists of effects-based tasks with appropriate measures and ISR collection requirements are a necessary part of the AOD.

The AOD should also be used to express the JFC's and COMAFFOR's guidance regarding what target categories (target sets) are time-sensitive, what the priority is among them, and what types of dynamic targeting would cause preplanned missions to be re-tasked. Categories of time sensitive targets (TST), high-value targets, and other objects of dynamic targeting should be presented in the context of the desired effects, and those desired effects prioritized against the desired effects for preplanned targets. This allows the COD to rapidly assess the value of preplanned targets against TST or emerging targets to determine whether or not to re-task air, space, or information assets. This guidance also reduces the possibility of all newly detected targets being struck. Just because a target can be engaged within the air tasking order (ATO) execution period does not mean that effort should be diverted from preplanned targets to engage it.

While daily guidance is critical to subsequent phases of the ongoing tasking cycle, the SD strategy plans team also works on longer-range planning, including study of branches and sequels. Conclusions drawn from this study should be disseminated throughout the AOC to assist in focusing later target development and intelligence collection efforts.

Finally, the AOD should include the COMAFFOR's guidance on which targets or target sets require immediate assessment feedback. ISR and PED assets are usually limited in number and the collection requirements for target development, joint intelligence preparation of the operational environment (JIPOE), indications and warnings, and other taskings may have a higher priority than combat assessment. Operations may be more efficient if assessment is focused on a select few high priority targets or sets.

TARGET DEVELOPMENT

Last Updated: 10 Jan 14

Purpose of the Target Development Phase. This is the phase in which the efforts of deliberate targeting relate specific targets to objectives, desired effects, and accompanying actions. Targeteers within the ISRD and the CPD TET take the effects determined during the objectives, effects, and guidance phase and analyze which targets should be struck (or otherwise affected) to accomplish them. Target development requires thorough examination of the adversary as a system of systems in order to understand where critical linkages and vulnerabilities lie. Critical elements are those a system requires in order to enable enemy capabilities and/or actions which are the focus of the commander's objectives and thus the source of the desired direct and cascading effects on the system. Critical linkages within a system often enable the functioning of several interrelated parts of the system, and so affecting them in the right way can disable several components, or even cause cascading system-wide failure. Vulnerable targets are those that can be attacked or otherwise affected. Thorough analysis should identify critical vulnerabilities, if they exist. These are elements of the adversary's system that are both critical and vulnerable. Analysis is made effective through access to the community of subject matter expertise and information regarding the functioning of systems that support adversary capabilities. This research may require expertise beyond that normally available on the COMAFFOR's planning staff. In such cases, reachback/federation entities may fill COMAFFOR staff shortfalls. It requires cooperation with other planning staffs and national interagency groups throughout the process. Target development involves five distinct functions, each discussed below:

- Target analysis.
- Target vetting.
- Target validation.
- Target nomination.
- Identification of intelligence gaps, collection and exploitation requirements.

The purpose of these together is to relate target development to tasking. The target nomination part of the process, the component target nomination list (TNL)

development, usually culminates in a target coordination meeting, held by the TET within the CPD (when the JFC delegates joint targeting coordination authority to the joint force air component commander (JFACC/COMAFFOR) with the assistance of the various joint components and multi-national liaison elements. The TET collates target nominations from all sources. It works with the ISRD and other agencies to analyze targets. It screens all nominated targets to ensure they meet commander's intent and are relevant. It allocates and prioritizes the nominated targets based on the best potential to achieve desired effects and objectives and coordinates to ensure other components' priorities and timing requirements are met. The product of this effort, when approved by the JFC or designated representative, is the JIPTL.

Target development influences and ultimately leads to target nominations and development of the JIPTL, joint target list (JTL), restricted target list (RTL), and no strike list (NSL). In combination with each component TNL, the JIPTL is ultimately created. As noted, all the phases of the tasking process are intertwined. Target development efforts can frequently force refinement of desired effects or even objectives, especially if weaponeering and allocation efforts indicate that a particular targeting avenue of approach is impractical. Target development efforts also frequently reach forward to influence weaponeering and allocation choices, dynamic targeting during execution, and the assessment process. The results of detailed target development are often stored in target system studies, individual target folders and targeting databases that can be studied by all levels of command and used in future target development efforts. Additionally, when detailed targeting development data are not available (i.e., a non-Joint Strategic Capability Planning directed planning effort), targeting and planning staffs should leverage the intelligence community functional target systems studies, models and simulations, experts to support target development efforts.

Target analysis takes the desired effects determined during planning or the first phase of the tasking cycle and matches them to specific targets. This analysis looks at the importance of various potential targets as enablers of enemy capabilities, as critical elements within enemy systems, or as potential trigger points for desired enemy behavior changes. There are many means available to accomplish this through the application of capabilities across the spectrum of targeting (i.e., influence operations, physical attack, cyberspace attack, etc.). Two of the most common that have been used in the past are target system and system of system analysis.

Target system analysis (TSA) approaches targets and target sets as systems to determine vulnerabilities and exploitable weaknesses. Targeteers review how a functional target system works as a whole and analyze the interactions between components. TSA takes a system-of-systems approach to look at interdependencies and vulnerabilities between systems as well as intra-system dependencies in order to maximize the effectiveness of target development. Ideally, TSA production begins in peacetime, before the commencement of conflict, and is accomplished with federated support and "reachback."

As part of a comprehensive system-of-systems analysis (SOSA) approach, TSA focuses on one or more of the many functional target systems identified by the Defense Intelligence Agency (DIA). These include infrastructure targets across an entire region

or nation (i.e., electrical power or petroleum, oil, and lubricants (POL) production), or non-infrastructure systems such as financial networks. SOSA seeks to find nodes common to more than one system, focusing on the interactions and interrelationships between system elements, in order to determine their degree and points of interdependence and to discern linkages between their functions. The ultimate goal of TSA is to find critical nodes and vulnerabilities that, if disrupted or affected in a specific manner, create effects that achieve the commander's objectives.

The analysis performed in target development proceeds through successively greater levels of detail, flowing from the macro (broad scope) level to the micro (narrowly focused) level. This winnowing approach is essential to preserve the linkage between desired effects and objectives and the specific actions that are taken against particular targets. It determines the necessary type, breadth, and duration of action that should be exerted on each target to generate effects that are consistent with the commander's objectives.

Targets for consideration come from a variety of sources. Many are developed pre-conflict and confirmed during planning. These may or may not come from a theater JTL maintained in peacetime. Many more are suggested during joint air operations plan (JAOP) development or by the SD as the air component's strategy evolve during a conflict. Many are derived by the AOC's targeteers themselves, as target analysis suggests the means of achieving desired effects.

Many targets are nominated by space and cyberspace support elements and other joint force components in the form of a TNL in order to achieve that component's desired effects. Upon dissemination of the AOD, and based on JFC guidance, components begin to develop their nominations for inclusion in the next ATO. Some targets may be suggested by government agencies outside the DOD or by foreign governments. The product of target analysis is a list of proposed target nominations designed to achieve the effects determined in earlier stages of planning (such as JAOP development or the objectives, effect, and guidance stage of the tasking cycle), which may then be validated. Other products may include creation of or additions to no-strike or restricted target lists (see "products of the phase," below).

Target research within the tasking cycle often entails studying previously unidentified or unlocated targets. Responsibility for the research lies primarily, but not solely, with the targets and tactical assessment (TGT/TA) team of the ISRD, which uses federated and reachback support to ensure that the AOC obtains, analyzes, and disseminates the information needed for further target development. Integration of full spectrum targeting capabilities is a critical part of identifying targeting opportunities and creating the appropriate lethal and nonlethal effects.

Determining the status of previously struck targets, enemy recovery and recuperation efforts, and changes in enemy tactics, processes, and strategy is a function of the TGT/TA team of the ISRD. This information is critical in validating the effectiveness of friendly action. It helps shape ongoing target development within the tasking cycle by showing where re-strikes or other further action may be required. It is also crucial to the SD's efforts to identify needed changes in the overall campaign strategy.

Target vetting assesses the accuracy of the supporting intelligence used to develop the target. Additionally, the vetting process results in the identification and documentation of collateral concerns associated with a specific target, as well as intelligence gain-loss concerns.

Target validation ensures all vetted targets are compliant with LOAC and ROE. Validation also ensures targets achieve the effects and objectives outlined in commander's guidance and are coordinated and de-conflicted with agencies and activities that might present a conflict with the proposed action. It also determines whether a target remains a viable element of the target system. During the development effort, the targets may also require review and approval based on the sensitive target approval and review process, coordinated through the combatant commander to national authorities. This phase is done by targeteers within the CPD TET, in consultation with the strategy plans team within the SD and other experts and agencies, as required. The first part of validation asks such questions as:

- Does the target meet COMAFFOR or higher commanders' objectives, guidance, and intent?
- Is the target consistent with LOAC and ROE?
- Is the desired effect on the target consistent with the end state?
- Is the target politically or culturally sensitive?
  - What may the effect of striking it be on public opinion (enemy, friendly, and neutral)?
- What are the risks and likely consequences of collateral damage?
- Is it feasible to attack this target? What is the risk?
- Is it feasible to attack the target *at this time*?
- What are the consequences of *not* attacking the target?
- May attacking the target negatively affect friendly operations due to current or planned friendly exploitation of the target?

The second part of validation starts the coordination and integration of actions against the target with other operations. This continues after the ATO is produced and responsibility is assumed by the COD. Part of coordination is de-confliction. Many offices and agencies must be coordinated with to prevent fratricide, collateral damage, or propaganda leverage for the enemy. Some examples of where coordination and integration are required:

- Special operations forces (SOF). The joint force special operations component commander (JFSOCC) must deconflict joint special operations with the JFC and the other component commanders to avoid fratricide. This is best done at a COMAFFOR targeting coordination meeting held as part of the TET's function. The

AOC should work through the special operations liaison element (SOLE) for deconfliction.

- Land forces. AOC personnel should work through the BCD (and Marine liaison element, when appropriate) and the air support operations center (ASOC) to ensure that air component targeting is coordinated and integrated with land component operations. Careful crafting and placement of fire support coordination measures (FSCM) facilitate this.

- Maritime forces. AOC personnel maintain close liaison with the maritime component through the naval and amphibious liaison element (NALE) and provide air, space, and cyberspace support, as required.[1]

- Search and rescue (SAR). SAR personnel must deconflict with current targeting operations and other ongoing operations to ensure the safety of any SAR operations.

- Space, cyberspace, and information operations. Space, cyberspace, and information operations should be cognizant of both intended and unintended effects created by the targeting process and ensure that these effects support the JFC's objecitives and strategies.

- Other government agencies. Targeting personnel should be aware of agency involvement and should work closely with the JFC's national intelligence support team (NIST).

Target Nomination. Once all of the components, allied, and agency target nominations for a given ATO are received, the TET prioritizes the nominated targets and places them in a TNL based on the commander's objectives. The TET then presents the TNLs through the appropriate coordinating bodies representing the joint force components and other required agencies to ensure their requirements are supported, joint force priorities are met, and desired effects are achieved.

If targeting functions are delegated appropriately, the final deconfliction and coordination of components' nominations should be at a target coordination meeting run by the TET. Component representatives should be prepared to justify target selections, since not all targets may be engaged based on the JFC's apportionment decision and the COMAFFOR's allocation. If differences arise and cannot be resolved at the meeting, the issue should be coordinated at higher levels for resolution. The meeting should not generally address mating of specific weapons to targets, but it should consider all capabilities and initiate the planning and coordination needed for those options. Additionally, the meeting may address the availability of certain high demand weapons or munitions on a particular ATO. However, the availability of weapons or capability should not drive the nomination of targets—this is antithetical to an effects-based approach.

[1] JP 3-32, *Command and Control for Joint Maritime Operations.*

The result of coordination is the draft JIPTL, which is submitted to the JFC or designated representative for approval. Again, targets may be added to no-strike or restricted target lists as a result of this part of the process highlighting RTL targets (for possible approval) and sensitive target approval and review (STAR) targets.[2]

Identifying collection and exploitation requirements through assessment is critical to targeting efforts. This stage attempts to answer the question, "How may we know that we have achieved the desired effects?" by establishing intelligence collection and exploitation requirements for each nominated target. This stage begins with target analysis and runs parallel to the other stages. The requirements should be articulated early in the tasking process to support target development and ultimately assessment. Targeteers should work closely with collection managers to ensure that target development, pre-strike, and post-strike requirements are integrated into the collection plan, along with any changes that occur throughout the tasking cycle. This intelligence support is also required to prepare for future targeting during execution (e.g., to pre-task real time ISR assets) and to support post-strike assessment of success. It should be noted that first-order effects of nonlethal operations are often subtle; in various instances may be of short duration for enabling purposes only or require days to months for the effect(s) to resolve, if at all, and may have effects that relate to the broader context of the target system (e.g., only visible at the operational or strategic level). Further, assessment of second- and third-order effects can be even more difficult. For these reasons nonlethal pre- and post-strike collection requirements are critical for ensuring a cohesive means exists to assess the intended effects. The product of this stage may be a joint integrated prioritized collection list (JIPCL).

Target List Development. Various target lists are created for use by the JFC to ensure the accuracy of target intelligence and validity of deliberate targeting in relation to guidance and LOAC. These JFC managed lists include the JTL, RTL, and the NSL. The daily joint integrated prioritized target list (JIPTL), is created for use by the COMAFFOR to support the desired effects to be achieved on the corresponding ATO. Responsive and verifiable procedures should be in place for additions or deletions to any of the lists. However, commanders should be aware of the larger impact to effects based planning when individual targets are removed from the JIPTL or restrictions are applied. The removal or servicing restriction of one seemingly isolated target on a JIPTL may cause an entire target set grouping to become invalid thus requiring the identification of a different grouping of targets within the same or across one or more additional/alternate target sets to create the same effect.

Before a nomination becomes a target, it is a candidate target that is developed, vetted, and validated. The candidate target list (CTL) is a list of selected target development nominations (TDN) submitted to the JFC for inclusion in the joint targeting process that are considered to create an effect that is consistent with the commander's objectives. The JTF staff, joint forces subordinate to the JFC, supporting unified commands, and components all submit TDNs to the JFC for inclusion on the CTL.

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[2] See Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3122.06, *Sensitive Target Approval and Review (STAR) Process* (classified publication), for more information on sensitive targets.

The second step of Phase 2 (Target Development) begins with the TDNs on the CTL being vetted and validated, and the JFC determining on which list the target should be placed. JTL is a consolidated list of targets upon which there are no restrictions placed and are considered to have military significance in the joint force commander's operational area. Essentially, the JTL is a compilation of all known, vetted, and validated targets that may be selected by any component for any type of action; exploitation or attack, lethal or nonlethal, air, ground, space, cyberspace, or other execution methods. The air component, as with other components, may develop target nominations for inclusion on the JTL via the CTL process.

JTF components select targets from the JTL to compile their respective TNLs and forward them to the JFC. Even in a mature theater unanticipated conflicts may not have a JTL from which components may select their TNLs. In this case, as we saw in Afghanistan, components will nominate targets for engagement without reference to a standing list. The TNLs are then combined, validated, and prioritized to form a draft JIPTL that is submitted to the JTCB for finalization. At each successive level throughout the life cycle of a target, a validation process occurs that checks targets against the NSL, RTL, ROE, current intelligence, commander's guidance, etc. Component commanders request the JFC (or the JFC's appointed representative) review and approve RTL targets nominated to the JIPTL that exceed the specified restrictions before execution. During operations, the JFC may delegate the authority to create the draft JIPTL to the COMAFFOR. If given this authority, the COMAFFOR's TET should execute the function of draft JIPTL creation.

The draft JIPTL is formed from consolidating and prioritizing the component TNLs based on prioritized JFC objectives. Those compiling the JIPTL consider the estimated available force capabilities and their ability to affect the targets on the list. The list usually contains more targets than can be serviced by the resources available. Thus, a draft JIPTL "cut line" is usually established. This "cut line" should reflect which targets should most likely be serviced for that ATO cycle, as well as the joint space tasking order (JSTO) and cyber tasking order (CTO) cycles. It should be clearly understood that the "cut line" simply reflects an estimate of the line above which targets are expected to be serviced by available resources, in priority order, and does not guarantee that a specific target will be attacked. Other variables like TSTs, changes in JFC priorities, emerging crisis, and changing resource availability may have an impact on target servicing. The JFC may also prohibit or restrict joint force attacks on specific targets or objects based on military risk, LOAC, ROE, or other considerations. Targeting restrictions fall into two categories, no strike (sometimes called prohibited) and restricted.

The NSL is a list of objects or entities characterized as protected from the effects of military operations under international law or the ROE. Attacking these targets may violate the LOAC (e.g., cultural and religious sites, embassies belonging to countries not party to the conflict, hospitals, and civilian schools), interfere with friendly relations with other nations, indigenous populations, or governments; or breach national guidance and ROE that stipulates authorized targets/target systems (e.g., national guidance to not damage the nation's economic infrastructure). The NSL is compiled

independent of, and in parallel to, the CTL. It is important to note, however, that entities from the CTL may be moved to the NSL if, as a result of additional target development, it is determined that attacking them may violate the LOAC and/or guidance. Conversely, targets placed on a NSL may be removed and become subject to military action if their status as a protected object or entity has changed. It is critical to include the relevant staff judge advocate (SJA) in all aspects of target development and target list management. For example, religious and medical structures that functions as a weapons storage or barracks facilities may lose their protected status and may be legally attacked. However, not all situations create an automatic revocation of protection. For instance, the placement of an anti-aircraft artillery (AAA) piece on a medical facility, though an action in violation of LOAC, does not result in the loss of protection; but neither does the protection status negate the legal authority to attack the AAA. The situation requires special handling by planners and attackers to determine whether the AAA must be attacked and to ensure minimal effects upon the hospital when attacked, to include the appropriate collateral damage estimation (CDE) review and approval.

A restricted target is a valid target that has specific restrictions placed on the actions authorized against it due to operational considerations. Actions that exceed specified restrictions are prohibited until coordinated and approved by the establishing HQ. Attacking restricted targets may interfere with projected friendly operations. This list also includes restrictions on targets directed by higher authorities. The targets on the RTL are nominated by elements of the joint force, approved by the JFC, and include restricted targets directed by higher authorities. Targets may have certain specific restrictions associated with them that should be clearly documented in the RTL, such as do not strike during daytime or strike only with a certain weapon. Some targets may require special precautions, such as chemical, biological, or nuclear facilities, or targets in close proximity to no-strike targets. When targets are restricted from lethal attacks, targeteers should consider nonlethal capabilities as a means to achieve desired effects or support the objectives.

The previous section identifies key linkages between the joint targeting process and the air tasking cycle. Both elements should synchronize in every aspect of the process to ensure that the air component is adhering to the JFC's guidance and objectives with regards to targeting.

Products of the Phase

The JIPTL is a prioritized list of targets and associated data approved by the JFC or designated representative and maintained by the joint force. An approved JIPTL is the central product of the target development phase. Targets and priorities are derived from the recommendations of components in conjunction with their proposed operations supporting the JFC's objectives and guidance. Although it draws from many sources, the CPD TET has primary responsibility for the JIPTL within the AOC.

The JIPCL is a prioritized list of intelligence collection and exploitation requirements needed to support indications and warning, analysis, and future target development efforts and to measure whether desired effects and objectives

are being achieved. Requirements and priorities are derived from the recommendations of components in conjunction with their proposed operations supporting the JFC's objectives and guidance. An approved JIPCL is a product of answering information gaps as well as the collection and exploitation requirements stage of target development. The ISRD has primary responsibility within the AOC for the JIPCL, although considerable consultation with the SD OAT is required.[3]

The NSL is a list of objects or entities characterized as protected from the effects of military operations under international law and/or rules of engagement. Attacking these may violate LOAC—interfere with friendly relations with indigenous personnel or governments or breach ROE. Combatant commanders (CCDRs) and JFCs determine which targets are included on the NSL based upon inputs from components, supporting unified commands, or higher authorities. Targets on this list require national-level approval to strike. Targets on the NSL can only be moved to the RTL or JIPTL with national-level approval.

The RTL is a list of targets that have specific restrictions imposed upon them. Some actions on restricted targets are prohibited until coordinated and approved by the establishing headquarters. Targets are restricted because certain types of actions against them may have negative political, cultural, or propaganda implications, or may interfere with projected friendly operations. The RTL is nominated by elements of the joint force and approved by the JFC. This list also includes restricted targets directed by higher authorities. Actions taken by an opponent may remove a target from the RTL.

[3] See Air Force Instruction 13-1 AOC, Volume 3 for an expanded discussion on AOC divisions and teams.

WEAPONEERING AND ALLOCATION

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Purpose of the Phase. Weaponeering is the process of determining the quantity of a specific type of lethal or nonlethal means required to create a desired effect on a given target.[1] Allocation, in the broadest sense, is the distribution of limited resources among competing requirements for employment. There are two aspects relevant to the air tasking cycle: allocation of targets and allocation of forces. Weaponeering and allocation function together to produce the master air attack plan (MAAP). These efforts commence before the JIPTL is approved and continue past MAAP production into execution planning. They are integral to all aspects of targeting.

Weaponeering considers such things as the desired effects against the target (both direct weapons effects and indirect desired outcomes the second and third order effects), target vulnerability, delivery accuracy, damage criteria, and weapon reliability. Targeteers quantify the expected results of lethal and nonlethal capabilities employment against prioritized targets to produce desired effects. It results in probable outcomes given many replications of an event. It does not predict the outcome of every munitions delivery, but represents statistical averages based on modeling, weapons tests, and real-world experience. With modern weapons, however, the probabilities of accurate delivery and of achieving intended direct effects are high and steadily increasing. Weaponeering is normally done by TGT/TA team prior to TET using validated data and methodologies automated by the Joint Technical Coordinating Group for Munitions Effectiveness and the Defense Threat Reduction Agency, as well as appropriate data and methodologies for specialized/emerging capabilities associated with space and cyberspace capabilities. Weaponeering for space (non-terrestrial) and cyberspace targets is conducted by the Joint Space Operations Center (JSpOC) and 624th Operations Center (OC), through their parent combatant commands respectively, using applicable tools and methods. The final weaponeering solution is chosen by the MAAP Team. The output of weaponeering is a recommendation of the quantity, type, and mix of lethal and nonlethal weapons needed to achieve desired effects while avoiding unacceptable collateral damage. All approved targets are weaponeered to include at least the following:

- ✪ Target identification and description.

[1] JP 3-60.

- Recommended aim points/joint desired point of impact (JDPI).
- Desired scope, level(s) and duration of damage, destruction, degradation, denial, disruption, deterrence, suppression, corruption, usurpation, neutralization, delaying, influence, exploitation, or other planned effects.
- Weapon system and munitions recommendations.
- Fuzing requirements (if required).
- Probability of achieving desired direct effect(s).
- Target area terrain, weather, and threat considerations.
- Collateral damage considerations.
- Collateral effects.

Precautions must be taken to avoid or minimize civilian casualties and damage to civilian infrastructure, and nonlethal collateral effects to civilian property which may also inadvertently affect civilian property outside the area of operations. The danger of collateral damage and effects varies with the type of target, terrain, weapons used, weather, the proximity of civilians and their structures, and the level of integration or shared communication infrastructures among the military, civil, government, private, and corporate environments.

According to LOAC, incidental damage to civilian objects must not be excessive in relation to the expected military advantage to be gained. Collateral damage criteria were established on this foundational principle.[2]

Collateral damage methodologies are aids to the decision-maker when approving targets for military action. They provide logical and repeatable methods to ensure due diligence in limiting civilian suffering while enabling the commander to assess risk in the accomplishment of military objectives. Collateral damage estimates are not designed to limit military action, but to mitigate, to the best of our ability, the unintended consequences of that military action. Military objectives are limited to those objects which, by their nature, location, purpose, or use make an effective contribution to obtaining the established end state. Only those targets whose total or partial destruction, capture, or neutralization, in the circumstances ruling at the time, offer a definite military advantage.

If an attack is directed against dual-use objects that might be legitimate military targets but also serve a legitimate civilian need (e.g., electrical power or telecommunications), then this factor should be carefully balanced against the military benefits when making a weapons selection, as must reconstruction and stabilization considerations following the end of hostilities. Thus, those conducting weaponeering should always keep commander's objectives and the end state in mind, as should those in other AOC teams and divisions who review weaponeering solutions and the MAAP. This includes the

[2] CJSCI 3160.01, *No Strike and Collateral Damage Estimation Methodology*.

non-AOC weaponeering and attack planning processes for nonlethal operations. The methodologies and data used for weapon effectiveness estimation are also capable of producing estimations of collateral damage risk to noncombatants and non-targeted facilities. Established ROE and LOAC also address collateral damage concerns (see Appendix A). Targeteers must comply with Joint Chiefs of Staff (JCS) CD estimation directives and instructions. For example, it may sometimes be necessary to strike a target more precisely than would otherwise be necessary in order to avoid collateral damage. Certain levels of collateral damage estimation require expertise that lies outside of the COMAFFOR's or even the JFC's control and should be coordinated through the TGT/TA Team via federated and reachback relationships. External organizations should also comply with the same strict guidance on CDE that is imposed under ROE, LOAC, and current CJCS instructions.

It is critical to stress that all estimates generated during this phase are situation-specific, reflecting the pairing of a particular capability against a particular target, under a particular condition of employment. As such, users of this information should be cautioned against assuming that the estimated effectiveness of a force capability under one set of circumstances is broadly applicable to other circumstances. Relatively minor targeting variations may have an exaggerated impact on effects estimates. It is equally important to stress that these estimates of performance are not designed to take into account considerations outside of the realm of weapon-target interaction (e.g., they do not address whether or not the delivery system may survive to reach the target.).

Targeteers should know the capabilities of platforms, weapons, and fuses for kinetic weapons available for use and be aware of their availability. They should also be familiar with the standard conventional load platforms in their theater and delivery tactics. Weaponeering results may only be useful if the employment parameters assumed in weaponeering match those used in combat. Targeteers should work closely with the operations and logistics staff to obtain required information. As a rule of thumb, theater component targeting branches should request a copy of the time-phased force and deployment data (TPFDD) to obtain units' expected input options selected from the employed automated weaponeering programs, and to provide realistic planning data. Targeteers should also coordinate with space and cyberspace liaison officers (LNOs), and other special access programs for capabilities not available via TPFDD and weaponeering tool synchronization. Weaponeering should also take into account the availability of the various weapons being considered. Certain high value weapons, such as those capable of deep penetration or other special effects, are normally limited in number and should only be used against those targets that both require the weapon for successful attack and are of sufficiently high priority to warrant the expenditure of the resource. Finally, some weapons, particularly certain capabilities, require long lead times in planning, deployment, and approval, which means that such capabilities should be thought about early and included at the beginning of the JOPPA process.

The weaponeering phase of the planning process is also where lethal and nonlethal effects are may be planned against targets. Coordination with the information

operations team (IOT)[3] is critical during this phase to ensure all operations (space, cyberspace, information, EW, etc.) are deconflicted, appropriately resourced, and phased over the battle space. There are a variety of tools available to planners to attempt to summarize and quantify the assessed impact of nonlethal operations. Since these techniques and capabilities are not fully normalized in most AOCs, it may be necessary to leverage the assistance of specialized teams in the DOD and academic communities.

Allocation is the translation of the air apportionment decision into the total number of sorties or missions by weapon system type available for each objective or task. It falls under the CPD MAAP team, which takes the final prioritized list of weaponeered targets and allocates airpower by melding available capabilities and resources, and weaponeering recommendations. The result is a translation of the total weight of air effort into the total number or sorties or missions required to achieve desired effects.

Prior to the TET target coordination meeting, the MAAP team determines how many aimpoints can be serviced on the given ATO day. The TET then reviews the lists of nominated targets and determines which "make the cut" on that day's proposed JIPTL. The TET should work closely with the SD and the MAAP Team to ensure that the prioritized list ties into the JAOP and AOD appropriately. The SD should ensure that the TET understands how effects and objectives are prioritized, how they are to be achieved over time, and that it has a macro-level idea of the number of targets associated with each objective. The TET then collects target nominations from other sources and works a daily allocation of targets that have been planned against the effects and objectives to build the daily JIPTL. Approaching JIPTL construction in this way helps avoid an ad hoc, target-servicing approach.

Each air capable joint force component submits an allocation request (ALLOREQ) message to the COMAFFOR (timed to coincide with the beginning of the MAAP part of the tasking process, usually not later than 36 hours prior to the start of a given ATO day). ALLOREQs contain requests for air and space component support and information on sorties from other components not required for organic component support that are available for COMAFFOR tasking. The MAAP team works with the TET to take the approved JIPTL (to include weapon restrictions, timing issues, and other restraints) and inputs from the component liaisons, the AMD (especially concerning tanker availability), and others to produce the MAAP. They determine an overall sortie flow for the ATO period and determine how that flow should be divided into packages—discrete sets of missions and sorties designed to complement each other or provide required support (for example, tankers and electronic warfare assets packaged with the strike assets supported). They also determine required times over target or times on station. Packages are arranged in sequence and used to determine a timeline and resource requirements for the ATO period. Each package should be de-conflicted in time, space, and effect.

[3] See Air Force Instruction 13-1 AOC, Volume 3 for an expanded discussion on AOC divisions and teams

Part of the allocation and MAAP portions of the tasking process is the creation of an ISR collection and assessment plan. Early planning for assessments is critical to ensure that target status can be quickly determined to meet restrike recommendation criteria. Theater ISR collection assets should be carefully orchestrated to ensure optimal coverage of the operational environment. Collection assets should be positioned not only to provide assessment of targets planned for attack, but should be able to detect and collect on emerging targets and be flexible enough to collect against them as well. At the same time, ISR collection assets should continue to monitor the operational environment in order to help discern whether desired effects are being created and whether the enemy is adapting his courses of actions (COAs) to our actions. The collection assessment plan cannot be made in a vacuum and should be closely coordinated with all other planning efforts.

The AOC should establish procedures to ensure that the organizations nominating targets receive continuous feedback on the status of their nominations throughout the tasking cycle. For example, not all targets nominated may be approved for the draft JIPTL, nor may all targets on the approved JIPTL be included on the ATO. There should be a feedback mechanism to ensure that targets not attacked, for any reason, are reported to the nominating authority for consideration on future TNLs.

Products of the Phase. The MAAP is the COMAFFOR's time-phased air component scheme of maneuver for a given ATO period, synthesizing commander's guidance, desired effects, supported components' schemes of maneuver, friendly capabilities, and likely enemy COAs, and allocating friendly resources against approved targets.[4] The MAAP is developed by CPD's MAAP team and usually presented in the form of a decision briefing for the COMAFFOR. This product is critical for the targeting personnel to provide information to the collection managers in developing their collection and assessment planning.

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[4] Note: this modifies the joint definition found in JP 3-60 ("A plan that contains key information that forms the foundation of the joint air tasking order.).

ATO PRODUCTION AND DISSEMINATION

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Purpose of the Phase. Accomplished by the CPD ATO production team, this phase finalizes the ATO and associated orders, produces them, and disseminates them to combat units. It is based on commander's guidance (especially the AOD), the MAAP, and component requirements. Airspace control and air defense instructions should be provided in sufficient detail to allow components to plan and execute all missions listed in the ATO. These are usually captured in the airspace control order (ACO) and the day's special instructions (SPINS). Instructions contained in the SPINS and the ACO are updated as frequently as required. The ATO, ACO, and SPINS provide operational and tactical direction at appropriate levels of detail. The level of detail should be very explicit when forces operate from different bases and multi-component and/or composite missions are tasked. By contrast, less detail is required when missions are tasked to a single component or base. Components may submit critical changes to target requests and asset availability during this phase of the cycle. Parallel IRC processes may also result in the production of functional specific task orders like the cyber tasking order (CTO) and joint space tasking order (JSTO), as based upon applicable functional guidance like the Cyber Control Order (CCO) and SOD.

This stage of the process is where targeting instructions are communicated from the operational level to the tactical level (i.e., weapons standard conventional loads, weapon pairing with target and JDPI's, time on target, and fuse settings). It is imperative that targeting instructions include the desired objective of the mission. The mission commander is the final decision-maker prior to execution and must understand the desired effect to be achieved. Concurrent with the ATO, the AOC should make available relevant target materials that may assist tactical units in their mission planning efforts.

Products of the Phase. The ATO is a medium used to task and disseminate to components, subordinate units, and command and control agencies projected sorties, capabilities and/or forces to targets and specific missions. It normally provides specific instructions to include call signs, targets, controlling agencies, etc., as well as general instructions. The ATO may subsume the ACO and SPINS or published as separate orders.

SPINS are a set of instructions that provide information not otherwise available in the ATO, but are necessary for its implementation. This may include such information as commander's guidance (often including the AOD itself), the C2 battle management plan, combat search and rescue procedures, the communications plan, and general instructions for inter- and intratheater airlift.

ROE are rules issued by higher authority that establish imperatives, constraints and restraints. They should be published separately, versus being buried in the SPINS or another document.

The ACO provides direction to integrate, coordinate, and deconflict the use of airspace within the operational area. (Note: this does not imply any level of command authority over air assets.)

The reconnaissance, surveillance, and target acquisition (RSTA) annex is produced during this stage by the ISRD. The RSTA annex is the ISR supplement to the ATO. It contains detailed tasking of intelligence collection sensors and processing, exploitation, and dissemination (PED) nodes and provides specific guidance to tasked ISR assets, including ISR platforms, sensors, and (PED).

EXECUTION PLANNING AND FORCE EXECUTION

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Purpose of the Phase. Execution planning includes the preparation necessary for combat units to accomplish the decentralized execution of the ATO. Force execution refers to the 24-hour period an ATO is executed by combat units, which generally includes 12 hours immediately prior to the start of a given day's execution period. The AOC aids both, preparing input for, supporting, and monitoring execution. **The COMAFFOR, as the Air Force's warfighting commander, directs execution of Air Force capabilities. If a JFACC is appointed, that commander directs execution of air component capabilities and forces made available for joint or combined operations.** It is normal, of course, for the COMAFFOR to also be the JFACC. Inherent in this is the authority to redirect joint or combined air assets made available for tasking. Under the Air Force tenet of centralized control and decentralized execution, unit commanders are given the freedom and flexibility to plan missions and delivery tactics as long as they fall within timing requirements, ROE, and intent of effects. The COMAFFOR coordinates redirection of sorties that were previously allocated for support of component operations with affected component commanders. For targeting, this is the application of all previous steps of targeting and monitoring the execution in preparation for assessment. **During execution, the AOC is the central agency for revising the tasking of air forces, the JSpOC is the central agency for revising the tasking of Air Force space forces, and the 624th OC is the central agency for revising the tasking of Air Force cyberspace forces.** They are also responsible for coordinating and deconflicting any changes with appropriate agencies or components. These operations centers may or may not have authority to re-direct use of other capabilities supporting theater efforts, depending upon the asset.

Due to operational environment dynamics, the COMAFFOR may be required to make changes to planned operations during execution. The AOC should be flexible and responsive to changes required during execution of the ATO. **Forces not allocated for joint or combined operations, but included on the ATO for coordination purposes, can be redirected only with the approval of the respective component or allied commanders.** During execution, the COMAFFOR is also responsible for retargeting air assets to respond to emerging targets or changing priorities. The COMAFFOR may delegate the authority to re-direct missions made available for higher priority targets to C2 mission commanders as necessary. The AOC should be notified of all redirected

missions. This can have significant impact on the ISR and collection planning efforts and require significant oversight by targeting personnel within the AOC.

The COD supervises the detailed execution of the ATO. Targeteers monitor ATO execution and recommend alternate targets when necessary. Normally, targeting changes are needed due to adverse weather, assessment requirements, or modification of priorities. The ability to quickly recommend good alternate targets is very important to the flexibility of airpower. Combat operations targeteers should be aware of all significant information on the current ATO to include targets, desired effects and objectives, guidance, and ROEs, and weaponeering and collateral damage estimates.

The rational use of force relies on the capability to achieve positive identification (PID) and geolocation of adversary entities as a precursor to taking action against them. Conducting CID of **all** operational environment entities is thus a critical enabling capability in any use, or potential use, of military force. Identifying adversary or enemy entities is essential, of course, but so is identifying friendly and neutral entities. Blue force tracking (BFT) is a core function of combat identification (CID). BFT is the employment of techniques to identify and track US, allied, and coalition forces for the purpose of providing commander's enhanced situational awareness and reducing fratricide.

ASSESSMENT

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Purpose of the Phase. Assessment is a continuous process that measures the overall effectiveness of employing joint force capabilities during military operations. It is also the determination of the progress made toward accomplishing a task, creating a condition, or achieving an objective.[1] It helps answer basic questions such as:

- "Are we doing things right?"
- "Are we doing the right things?"
- "Are we measuring the right things?"

The first question addresses the **performance** of planned air operations by assessing the completion of tasks. The second question addresses the level at which the commander's desired *effects* are being observed in the operational environment and prompts examination of the **links** between performance and effects. The third question addresses the process of assessment itself and the importance of understanding how we choose to measure the links between performance, cause, and effect. When determined properly, the answers to these questions should provide the commander with valid information upon which to base decisions about strategy.

In an effects-based construct, it is not possible to think about actions and effects without considering how accomplishment of those effects should be measured. Effects and objectives should always be measurable and planning for them should always include means of measurement and evaluation. Assessment is not a separate phase of the air tasking—or any other—cycle, as descriptions and graphics often imply for the sake of conceptual clarity. Rather, it is interwoven throughout the planning and execution phase and is inseparable and integral component of the effects-based approach to conflict. Planning for assessment begins prior to commencement of operations and continues well after operations are over. It is a central part of an effects-based approach to conflict assessment that occurs at the strategic, operational, and tactical levels. From an Air Force perspective, assessment is conducted at unit level with intelligence and operational personnel identifying estimated level of mission success with supporting data (e.g., mission reports [MISREP], weapon system video [WSV],

[1] JP 3-0, *Joint Operations.*

etc.) and at the operational level by AOC, JSpOC, and 624th OC personnel, who may leverage other organizations for reachback support. Each lower level feeds the levels above it and provides a basis for broader-based evaluation of progress. Products from each level provide the foundation for strategic level assessments that include target system and overall campaign assessment.

Any comprehensive view of assessment should tie evaluation of progress at the tactical level to all other levels of war, up to and including the national strategic level. The proper focus of assessment conducted by the air component should be on the operational level of war. An effective assessment construct should also support commanders' objectives at all levels, support commanders' decision cycles in real time, and provide the basis for analysis. To accomplish these things, an effective assessment construct should address the entire spectrum of operations and all levels of war, permit component validation of assessment elements, focus on effects, standardize federation, utilize intelligence specialties effectively, and integrate analysis efforts to the maximum extent possible.

MEASURES AND INDICATORS

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At all levels of assessment, planners should choose criteria that describe or establish when actions have been accomplished, desired effects created, and objectives achieved. These criteria are called "measures and indicators." There are two common types of measures:

- Measures of performance (MOP): A criterion used to assess friendly actions that are tied to measuring task accomplishment.[1] An example of this would be five offensive cyberspace operations performed, 100 combat sorties flown, and 98% ordnance delivered effectively.

- Measures of effect (MOE): A criterion used to assess changes in system behavior, capability, or operational environment that is tied to measuring the attainment of an end state, achievement of an objective, or creation of an effect.[2] An example would be to prevent the enemy's weapons factory from delivering weapons to the enemy for at least 48 hours.

Measures and indicators are selected MOEs and MOPs established during planning. When selecting assessment measures, planners should identify the essential elements of information required to collect against them and provide guidance in the collection plan and JIPCL if special ISR resources are needed. These measures should be refined or amended during the tasking cycle, as the tactical situation or the status of the target changes. Selection of assessment measures is an iterative, ongoing effort.

To be useful as a gauge of effectiveness, a measure, whether a MOP or MOE, should be meaningful, reliable, and either observable or capable of being reliably inferred. Meaningful means it should be tied, explicitly and logically, to objectives at all levels. Reliable means it should accurately express the intended effect. If quantitative measures are used, they should be relevant. It is not sufficient to choose, for example, "fifty percent of enemy armor attrited" as an MOE without understanding *why* that measure is relevant to objectives. Observable means that existing ISR collection methods can measure it with the required precision to detect the intended change.

[1] Ibid.
[2] Ibid.

MOEs and MOPs may be quantitative or qualitative. Sometimes subjective measures, independent of other empirical measures, determine whether indirect effects and the objectives they lead to are being accomplished. Qualitative means primarily that judgment should be made in the absence of meaningful quantitative measures. Military personnel tend to be less comfortable with these rather than with more empirical, quantitative, measures, since they are generally trained to regard their profession as more of a science than an art, but often the numbers themselves involved in quantitative measures can deceive. Seemingly "scientific" quantitative measures are often poorer representations of what should happen in the operational environment than more qualitative measures, like "enemy armor units A, B, and C not offering larger than platoon sized resistance to forces closing on Phase Line X until at least day Y." Such a measure may be much more relevant to the friendly scheme of maneuver, be easier to collect against, and be easier for commanders to act upon. It is often easier, especially at the higher levels of assessment, to choose qualitative measures that are logically tied to objectives. Quantitative measures, on the other hand, can, through their very seeming certainty, take on a life of their own, leading to actions that do not contribute to accomplishing objectives or the end state. For example, during Operation DESERT STORM, strategic attack missions took down key nodes to deny power within the Iraqi electrical system. This effect was accomplished with little destruction of Iraqi civilian electrical power infrastructure. Nonetheless, many power generator plants were destroyed later in the campaign, in part because traditional empirical measurements of electrical capacity showed that the Iraqis still had substantial usable resources. By failing to apply a qualitative analysis to the empirically derived information, this destruction of Iraqi power plants ultimately hampered civilian recovery following the campaign. This example also points out the importance of integrating assessment into employment planning and target development efforts early on.

LEVELS OF ASSESSMENT AND MEASURES

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Assessors perform many types of assessment across the strategic, operational, and tactical levels to inform a wide array of decisions. These levels are distinct yet interrelated. Strategic-level assessment addresses issues at the joint force (e.g., winning a particular conflict) and national levels (e.g., enduring security concerns and interests). It involves a wide array of methodologies, participants, and inputs. The President and SecDef rely on progress reports produced by the CCDR or other relevant JFC, so assessment at their levels often shapes the nation's, or even the world's, perception of progress in an operation.

Operational-level assessment begins to evaluate complex indirect effects, track progress toward operational and strategic objectives, and make recommendations for strategy adjustments and future action extending beyond tactical re-attack. Assessment at this level often entails evaluation of COA success, assessment of the progress of overall strategy, and joint force vulnerability assessment. These are commonly performed by joint force component commanders (e.g., JFACC) and the JFC and their staffs.

Combat assessment (CA) is defined in JP 3-60 as the determination of the overall effectiveness of force employment during military operations. CA is composed of three major components: (a) battle damage assessment; (b) munitions effectiveness assessment; and (c) reattack recommendation.[1] CA typically focuses on task accomplishment and specific engagements. The results of tactical tasks, measured by MOPs, are often physical in nature, but also can reflect the impact on specific functions and systems. CA may include assessing progress by phase lines; destruction of enemy forces; control of key terrain, people, or resources; and security or reconstruction tasks. Assessment of results at the tactical level helps commanders determine operational and strategic progress, so JFCs should have a comprehensive, integrated assessment plan that links assessment activities and measures at all levels. From the Air Force perspective, these would include but not be limited to, in-flight reporting, weapon system

[1] With a broader concern for assessing operational, campaign level results, Air Force Annex 3-0 uses the term "Tactical Assessment" over "CA" because it is more broadly applicable and descriptively accurate: Not all operations (and hence not all assessments at the tactical level) involve combat. The name should apply to all tactical-level evaluation. The terms, however, are functionally equivalent for most purposes.

video (WSV), mission reports (MISREPs), full motion video (FMV) and cyberspace ISR activities.

CA determines the results of weapons engagement (with both lethal and nonlethal capabilities), and thus is an important component of joint fires and the joint targeting process. To conduct CA, it is important to fully understand the linkages between the targets and the JFC's objectives, guidance, and desired effects. CA includes the three related elements: battle damage assessment, munitions effectiveness assessment, and reattack recommendations or future targeting.

The purpose of battle damage assessment[2] (BDA) is to compare post-execution results with the projected results generated during target development. Comprehensive BDA requires a coordinated and integrated effort between joint force intelligence and operations functions. Traditionally, BDA is composed of physical damage assessment (PDA), functional damage assessment, and target system assessment; typically taking a three-phased approach to proceed from a micro-level examination of the damage or effect inflicted on a specific target, to ultimately arriving at macro-level conclusions regarding the functional outcomes created in the target system. This three-phase analysis suggests that BDA is both tactical and operational in nature.

Examining a hypothetical air strike scenario on a refining petroleum, oils, and lubricants target system, clarifies this process. Phase 1 BDA assesses the physical damage to the atmospheric distillation units at a refinery: six of the ten units were destroyed, two are damaged and two are on fire. Phase 2 BDA, assesses the functionality of the refinery.

- Phase 1 BDA: PDA estimates the extent of physical damage to a target based upon observation or empirically based interpretation. PDA involves cooperative effort between units in the field and the AOC. Sometimes it utilizes data from other components or national agencies. Sources such as inflight reports (INFLTREP), mission reports (MISREP), and weapon system video are commonly used to generate PDA.

- Phase 2 BDA: Functional assessment (FA) estimates the remaining functional or operational capability of a targeted object or entity. FA is usually inferred from reported physical damage and should include estimates of recuperation or replacement time. Note, however, that targets affected by many nonlethal capabilities often do not have physical damage, requiring assessors to perform FA in the absence of PDA. Assessment planners should anticipate appropriate measures and indicators for such effects.

[2] For additional information on the BDA process, see the Defense Intelligence Agency (DIA) publications DI-2820-4-03, *Battle Damage Assessment Quick Guide;* DI 2800-2-YR, *Critical Elements of Selected Generic Installations (Critical Elements Handbook)*; and JP 3-60, Appendix D, The Targeting Assessment Process.

- Phase 3 BDA: Target systems assessment is a broad assessment of the overall impact and effectiveness of military force applied against an adversary target system relative to the operational objectives established.

- Munitions effectiveness assessment (MEA): evaluates whether the selected weapon or munition functioned as intended. It examines the munitions' known parameters, the delivery tactics used, and the interaction between the munition and the delivery platform. MEA is fed back into the planning process to validate or adjust weaponeering and platform selections. It is also the form of assessment with the highest potential return on investment in terms of weapons and tactics development, because the data it generates is fed into the JMEM revision process, resulting in more accurate future capability analysis. MEA is inherently an operations function heavily supported by intelligence.

- Estimated damage assessment (EDA): EDA is a type of physical damage assessment and is the process of anticipating damage using the probability of weapon effectiveness to support Estimated Assessments and allows the commander to accept risk in the absence of other information. Many times during execution, it is not possible to wait on ISR verification of strike results without inordinately delaying presentation of assessments to decision makers. EDA is an evolving technique of using Service documented munitions effectiveness (e.g., reliability, accuracy, effects, etc.), MISREPs, and other data to predict weapons effectiveness on targets and target systems as place holders for the probabilities of success in absence of reported BDA; a process facilitated by the precision and reliability of modern weapon systems. For instance, depending on the target type, size, number of weapons employed, and associated probability of damage, a prediction can be made of the target's continued level of operational capability. This information is also used to weight the need for additional collection in lieu of inherent reporting from the weapon(s), aircraft, or aircrew to provide an assessed prediction of the level of physical and functional damage inflicted on selected targets and target systems. Essentially, the prediction becomes more accurate as additional information is received and incorporated, if the additional accuracy is needed. Due to EDA's requirements for empirical data, its use should be limited to weapons that have Air Force certified data and/or contained in JMEM. How and when EDA is used should be determined during deliberate planning but should also be reviewed prior to each ATO execution. In general, it is appropriate for all but high-priority targets, but considerations for schemes of maneuver and strategic implications must always be considered. Normally, the COMAFFOR will provide guidance as to which targets/target sets they are willing to accept risk when authorizing assessments based on EDA.

- Reattack Recommendations and Future Targeting: Future target nominations and reattack recommendations merge the picture of what was done (BDA) with how it was done (MEA) and compares the result with predetermined MOEs that were developed at the start of the joint targeting cycle. The purposes of this phase in the process are to determine degree of success in achieving objectives and to formulate any required follow-up actions, or to indicate readiness to move on to new tasks in

the path to achieving overall JFC objectives. Both operations and intelligence should work closely to present each target considered for restrike recommendation with the best and most current available information. Analysts may also discover that other targets in the system/network are now logical follow-on targets, or that the commander's objectives have now been met in regard to certain target(s), and that it is appropriate to recommend an end to further targeting within that target system or network. From the Airman's perspective, this element of Tactical Assessment occurs at the operational level. AOC planners are an integral part of providing the information to accomplish this for the COMAFFOR. Reattack recommendations should be consistent with JFC objectives and guidance.

Assessment has traditionally been an inherently federated undertaking. It relies upon intelligence and operational data. As such, organizations and individuals who may conduct assessment require access to the intelligence analyses of those who developed the targets and the operational information from the ATO which executes against those targets. See Appendix B for an expanded discussion on federated support for targeting and assessment.

Products of the Phase

Assessment products are diverse and vary with the level and type of assessment. For more on assessment refer to JP 5-0, Appendix D; JP 3-60, Appendix D; and AFI13-1AOCV3 .

APPENDIX A—TARGETING AND LEGAL CONSIDERATIONS

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Legal considerations and international legal obligations directly affect all phases of targeting. Those involved in targeting should have a thorough understanding of these obligations and be able to apply them during the targeting analysis.
Briefly discussed are the legal considerations impacting targeting:

- Basic principles of law of armed conflict (LOAC).
- LOAC considerations concerning personnel, objects and places.
- Rules of engagement (ROE) considerations.
- The role of judge advocate general (JAG) in targeting.

Targeting must adhere to the LOAC and all applicable ROE. It is the policy of the Department of Defense to comply with the law of war during all armed conflicts and other military operations regardless of how such conflicts and operations are characterized. The law of war is that part of international law that regulates the conduct of armed hostilities. The law of war encompasses all international law for the conduct of hostilities binding on the United States or its individual citizens, including treaties and international agreements to which the United States is a party, and applicable customary international law.[1] Military necessity does not provide authorization or justification for acts that are otherwise prohibited by the LOAC. Instead, military necessity must be applied in conjunction with other LOAC principles.

NOTE: This appendix is not all encompassing and is no substitute for legal advice from the appropriate Staff Judge Advocate (SJA). Constant coordination between planners, operators and JAGs is essential. The legal framework for the functional capability being employed (e.g., kinetic, space, cyberspace, etc.) depends on the nature of the activities to be conducted. Commanders, planners, operators, and targeteers must understand the relevant legal framework in order to comply with the laws and policies, the application of which may be challenging given the nature of nonlethal operations (e.g.,

[1] Department of Defense Directive (DODD) 2311.01E, *Law of War Program.*

ubiquity of cyberspace operations, regional effect of information operations (IO), etc.) and the often geographic orientation of domestic and international law.

BASIC PRINCIPLES OF LOAC AND THEIR TARGETING IMPLICATIONS

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LOAC rests on four fundamental principles that are inherent to all targeting decisions: military necessity, unnecessary suffering, proportionality and distinction (discrimination).

Military Necessity. *Is this target a valid military objective?* Military necessity acknowledges that attacks can be made against targets, but only targets that are valid military objectives. In this case, the term "military objective" in this context comes from the description in Additional Protocol I to the Geneva Convention that describes military objectives as "… [T]hose objects which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage." Though the United States is not a signatory to the Additional Protocol, it views this definition as an accurate restatement of customary international law that we recognize and with which we comply.[1]

For example, a residential home does not usually make an effective contribution to military action so is not usually a valid military target. However, a residence may become a valid military target if an adversary is using it for military purposes (such as a military command post, a fighting position, etc.). In that case, the purpose or nature of the objective has been changed by the adversary's actions and if a definite military advantage will be achieved through targeting the residence then it may be attacked.

Unnecessary Suffering (Humanity). *May the use of a particular weapon used to strike a target cause unnecessary suffering?* This principle is based in the Hague Conventions restrictions against using arms, projectiles, or materials calculated to cause *unnecessary* suffering and forbids the infliction of unnecessary suffering, injury or destruction not actually necessary for legitimate military purposes. All weapons in the US inventory are permissible for use unless otherwise restricted by higher authority for operational reasons. These weapons have been reviewed to determine if they comply with the LOAC and have been determined not to cause unnecessary suffering when

[1] The word "objective" as used above should not be confused with the definition "objective" in JP 5-0: "The clearly defined, decisive, and attainable goal- towards which every—operation is directed."

used in the manner in which they were designed. However, this principle also prohibits using an otherwise lawful weapon in a manner that causes unnecessary suffering.

An example of causing unnecessary suffering would be to modify munitions to disperse glass projectiles to complicate providing medical treatment to the wounded. The bottom line is to use the weapon/munitions as they are designed.

Proportionality. *Does the military advantage to be gained from striking a target outweigh the anticipated incidental civilian loss of life and property if this target is struck?* This requires the expected loss of civilian life and damage to civilian property incidental to attack not be excessive in relation to the concrete and direct military advantage anticipated from striking the target. Planners and commanders should weigh the expected military advantages to be gained from affecting a target against the incidental loss or injury to civilians and the damage or destruction of civilian property. The anticipated military advantage refers to the advantage from those actions considered as a whole, and not only from isolated or particular actions. A "military advantage" is not just a tactical gain, but can span the spectrum of tactical, operational or strategic levels.

For example, an armored vehicle used in combat is located at a school. The vehicle is a valid target. However, destroying the vehicle with certain types of munitions may place lives and safety of nearby non-combatants in jeopardy. The potential for injury to non-combatants should help guide the choice of lethal and/or nonlethal capabilities chosen against the vehicle.

Distinction (Discrimination). Have we distinguished between combatants and non-combatants; have we distinguished between military objectives and protected property or places? This principle, based on customary international law, requires parties to direct operations only against combatants and military objectives. It prohibits indiscriminate attacks which are attacks not directed at specific military objectives, those that employ a method or means of combat that cannot be directed at a specific military objective and those that employ a method or means of combat the effects of which cannot be limited.

For example: Dropping munitions—guided or not—in a residential area without regard to whether there are combatants or military objectives in the area simply because there may be adversary forces there would be an indiscriminate attack. The use of gravity-guided munitions (non-precision) against enemy combatants or military objectives is not of itself an indiscriminate attack.

LOAC TARGETING RESTRICTIONS

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Personnel

Are we targeting personnel protected under LOAC? Intentional direct attacks on civilians are prohibited. However, this is distinctly different from the incidental injury that may be caused to civilians or civilian objects as a result of an attack on a valid military target (collateral damage). Collateral damage is an issue of proportionality.

Protection of the Civilian Population. Civilian populations may not be intentionally targeted for attack. Acts of violence designed to spread terror among the civilian population are prohibited. However, civilians may not be used as "human shields" to protect military targets from attack. The fact that they may be used to do so does not necessarily prevent the military object from being attacked. As directed or time permitting, targets surrounded by human shields will be reviewed by higher authority taking into account policy and legal.

Protection of Wounded and Sick. Direct attacks on wounded and sick who are no longer contributing to an adversary's military operations are prohibited by the Geneva Conventions. As noted above, the incidental additional injury that might be caused to sick and wounded still on the battlefield in the proximity to valid military targets is an issue of proportionality. Also, the sick and wounded may not be used as shields or protect military targets from attack. The fact that they may be used to do so does not necessarily prevent the military object from being attacked. As directed or time permitting, targets surrounded by human shields will be reviewed by higher authority taking into account policy and legal considerations.

Protection of Prisoners of War. Direct attacks on prisoners of war (POW) are also prohibited by the Geneva Conventions. This protection occurs from the moment they surrender because they are no longer considered combatants at that point. POW camps or detention facilities should be marked so as to be visible from the air. However, it is also important that any POW facility be noted as such on a no strike list (NSL) to ensure there is no confusion on the part of aircrew between the POW facility and adversary forces that may be conducting rear-area operations.

Objects and Places

Are we targeting an object or place protected under LOAC? Intentional direct attacks on civilian objects generally are prohibited. However, this is distinct from the incidental injury that may be caused to civilian objects as a result of an attack on a valid military target. Likewise, there are instances when based on the facts of a particular situation a civilian object may be a valid military target. These are discussed below.

Protection of Civilian Objects. Civilian objects may not be intentionally targeted for attack. Civilian objects are civilian property and facilities other than those used to support or sustain the adversary's war fighting capability. Civilian objects that are being used to engage in or support hostilities may lose their protected civilian status and be legitimate military targets.

Civilian objects that may be legitimate military targets: Some facilities or objects that might be considered as civilian objects but are actually legitimate military targets based on the facts surrounding their nature, location purpose and use:

- Dual-Use Objects. These are facilities or objects that serve both a military and civilian purpose and may be legitimate military targets. For example a power grid that supports an enemy airbase, but also supports civilian cities/towns is dual-use, and may be considered a legitimate military target. A target such as this would need to be examined in light of *proportionality* and specifically as to whether targeting the power grid would be disproportionate to the effects caused to the surrounding civilian objects supported by the same power grid. Typically dual-use targets require a higher level of approval authority because of concerns as to the impact upon the civilian population.

- Economic Objects. These are typically factories, workshops and plants that make an effective (though not necessarily direct) contribution to an adversary's military capability. Like dual-use targets, these typically require a higher level of approval because of the particular facts and circumstances regarding the nature, location, use and purpose of the target.

- Lines of Communication. Transportation systems (road ways, bridges, etc.) and communication systems (TV, radio), while civilian in nature, may also be considered legitimate military targets based on their use. Like dual-use and economic objects, these may require higher level approval based on the particular facts and circumstances regarding nature, location, use, and purpose of the target.

Protection of Medical Units, Hospitals and Medical Transport. Under the Geneva Conventions, these are not to be attacked. These should be marked by a distinctive medical emblem such as the Red Cross, Red Crescent, or some other internationally recognized symbol to show that they are for medical use. Known medical facilities and structures may typically be placed in the combatant commander's NSL database. Like civilian personnel, these may not be used to shield legitimate military targets. For instance, placing a surface-to-air missile (SAM) system next to a hospital does not prevent an attack on the SAM system if necessary in self-defense. Usually the

combatant commander may issue guidance concerning the approval authority for mobile systems placed next to such protected objects when not acting in self-defense.

Protection of Religious, Cultural, and Charitable Buildings and Monuments. Under international treaties and customary law, buildings and monuments devoted to religion, art, charitable purposes, or historical sites are not to be attacked. These should be marked with internationally recognized distinctive emblems (such as the blue shield with two white triangles). Known buildings and monuments devoted to religious, cultural and charitable purposes may typically be placed in the combatant commander's NSL database. Properties considered to be cultural in nature are usually considered irreplaceable and the property of all mankind. Like civilians, these may not be used to shield legitimate military targets. For instance, placing a SAM in the ruins of an ancient temple would not prevent an attack on the SAM system if necessary in self-defense. Usually the combatant commander may issue guidance concerning the approval authority for striking mobile systems placed next to such protected buildings or monuments when not in self-defense.

RULES OF ENGAGEMENT

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Have applicable restrictions or requirements imposed by the ROE been complied with prior to striking a target? The ROE are directives issued by competent military authority to delineate the circumstances and limitations under which air, ground, and naval forces may initiate and/or continue combat engagement with other forces encountered. *Essentially, ROE are rules for a particular operation that govern the use of force to reflect the will of the civilian and military leadership.* ROE constrain the actions of US military forces to ensure their actions are consistent with domestic and international law, national policy, and objectives. Although ROE are not law, they are authoritative restrictions issued at the appropriate level of command to control the use of force. ROE are based upon domestic and international law, history, strategy, political concerns, and a vast wealth of operational wisdom, experience, and knowledge provided by military commanders and operators. ROE may be more *restrictive* than the LOAC for a given situation, but they can't be more *permissive* than allowed under LOAC—therefore compliance with ROE should guarantee compliance with LOAC.

Personnel involved in targeting should be involved in the development and refinement of ROE along with the judge advocates. Just as tasking and targeting are cyclical, so too is ROE development, and it may require constant input and refinement in order to meet operational requirements.

What is contained in ROE? There is usually information in the ROE that is directly applicable to how, when or under what circumstances targets may be struck. The ROE may contain such information as target approval authorities for certain types or classes of targets (economic objects, lines of communication), and approval authority for time-sensitive or high-collateral damage targets. It may also contain information regarding what weapons may be used, (like cluster bombs or anti-personnel mines) the conditions for use and approval authority for their use.

Where are ROE found? ROE may be found in the standing rules of engagement (SROE), a combatant commander (CCDR)'s theater-specific ROE, and ROE issued specifically for an operation (such as with Operations ENDURING FREEDOM and IRAQI FREEDOM).

Standing Rules of Engagement (SROE). These are contained in a classified CJCS Instruction. The SROE provide implementation guidance on the inherent right of self-defense and the application of force for mission accomplishment. The SROE also provide a framework for the development and implementation of ROE across the range of military operations. The important point to remember is that the SROE are not tailored to specific military operations. They provide guidance in the absence of operation-specific ROE, and do not contain specific targeting restrictions or considerations based on the circumstances of a particular operation.

Theater-Specific Rules of Engagement. These are the CCDR's theater-specific ROE. These ROE address specific strategic and political sensitivities of the AOR, and should be approved by the CJCS. Theater-specific ROE may have been issued in a separate message. Like the SROE, these may not provide specific targeting restrictions or considerations based on ongoing operational constraints.

Operation-Specific ROE. These ROE are promulgated by the President, Secretary of Defense, CCDR, and component commanders and are based upon the specific factors underlying the operation. The ROE might be sent to the components via message from the CCDR or could be incorporated into the operations order (OPORD). *The ROE are usually re-stated in the* joint air operations plan (JAOP) *and in Section Five of the air component's daily* special instructions (SPINS)*.*

Annex 1-04, *Legal Support*, ROE Chapter. This chapter provides guidance in how to develop ROE. Considerations discussed include: ROE development is a collaborative effort (vertical and horizontal among organizations); ROE development should integrate all players (JAG, commanders, planners, and operators); ROE should not be too specific or restrictive; and ROE need to provide simple, clear guidance to accomplish the mission.**"ROE-like" Restrictions Impacting Targeting**

Are there any other restrictions that may impact targeting? Restrictions that are not formally issued as ROE may exist in other documents. In theory, these would be explicitly incorporated in the ROE or at least incorporated by reference. In practice, this is not always the case. As such, it is imperative that all personnel involved in targeting work—operators, planners and judge advocates—ensure they are aware of ***all*** applicable targeting restrictions regardless of how these restrictions are characterized or issued. Some examples are listed below.

Target Lists. The NSL, restricted target list (RTL), and joint target list (JTL) are compiled and maintained by the combatant command. An NSL may contain those facilities and structures that are protected under LOAC (churches, hospitals, etc.). The RTL contains facilities and structures for which approval, in some cases, must first be obtained from the establishing authority before affecting. These facilities are on the RTL because there is some function or valid military reason that mitigates against a strike. Targets on the JTL may also contain restrictions in the target folders. Although a target itself may be approved for strike and placed on the JTL, its target folder may restrict specific DPIs from being struck or restrict the size or type of munitions that may be used against the target or some of its desired point of impact (DPI)s. For example, if

a target is near a sensitive site, such as a school, the DPIs closest to the school may be restricted entirely or restricted to only certain types of weapons.

Collateral Damage Methodology (CDM). Historically, various combatant commands have conducted CDM according to their own standards. JCS directives now delineate a coherent five-step process that standardizes DOD CDM practices.

The JAOP, cyber operations plan (CyOP), and joint space operations plan (JSOP). Many restrictions from the combatant commander, joint force commander (JFC), USCYBERCOM, JFCC-Space, and the commander, Air Force forces (COMAFFOR) may be found in sections of the JAOP, CyOP, and JSOP that set forth standing orders and commander's intent.

Special Instructions (SPINs). SPINs are periodically issued by the air operations center (AOC) and usually have several sections that may contain ROE. Most SPINs have a subsection specifically called "ROE" that may contain ROE changes until a new version or regular changes to the OPORD can be published. This section may also contain any amplification the COMAFFOR deems necessary for complex ROE provisions.

Fragmentary Orders (FRAGO). In some past operations, restrictions from the CCDR impacting targeting were also published in FRAGOs.

Fire Support Annex. The fire support annex to an OPORD may also contain additional guidance or information concerning targeting.

Coalition Concerns. Coalition forces may have their own set of ROE that may not be similar to US ROE. That may impact whether coalition forces have the authority to strike certain sensitive targets such as leadership, weapons of mass destruction (WMD), etc. or the type of support they are able to provide to US forces striking those targets. US forces operating from coalition bases (e.g., Diego Garcia) may also have restrictions placed on them—and on the targeting they execute—by coalition ROE as well. Close coordination is required with coalition partners during targeting to facilitate the understanding of their ROE and the limits it may impose on them.

ROLE OF THE JUDGE ADVOCATE GENERAL

The JAG assists the planners and operators with reviewing targets for compliance with applicable LOAC/ROE restrictions (including collateral damage and other CCDR restrictions) prior to mission execution. Legal advice and counsel is necessary to the development, interpretation, modification, and proper implementation of the ROE. JAGs and their support staff should be trained, operationally oriented, and readily accessible to assist planners and operators with international legal considerations and ROE or related issues. JAGs provide legal advice to commanders and their staffs consistent with the international and domestic legal obligations and the governing ROE. The complexity of international legal considerations along with the ROE requires JAGs to be available at all stages in the tasking cycle. JAGs are usually available 24/7 to the strategy, plans, and operations divisions within an AOC. Additionally, JAGs are usually available at the expeditionary wing and group level to assist commanders, aircrew, and planners at the tactical level with targeting-related issues. It should be emphasized, however, that the military commanders and operators make the ultimate targeting decisions; however, inputs and counsel provided by the JAG and JA staff are considered. Legal considerations must be addressed when analyzing military necessity, imminent threat, and/or operational gain by the COMAFFOR and JFC.

NUCLEAR TARGETING

Last Updated: 10 Jan 14

Nothing discussed within this document, including LOAC and targeting implications, precludes the use of nuclear weapons. Nuclear targeting mirrors the conventional targeting principles discussed, with consideration given for specific weapons effects. Commanders must assess the military as well as political impact a nuclear strike would have on their operations. Nuclear planning guidance issued at the CCDR level is based on national-level political considerations and is influenced by the military mission. Air Force targeteers assigned to US Strategic Command conduct nuclear planning in coordination with supported CCDRs and certain allied commanders. However, the supported commander does not effectively control the decision to use nuclear weapons.

APPENDIX B—FEDERATED SUPPORT TO TARGETING AND ASSESSMENT

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Targeting and assessment requirements are typically more than theaters can support internally, due to deficiencies in manpower and specialized expertise. Thus, in practice, targeting is federated among many different organizations—in the theater, in the United States, and worldwide. The commander, Air Force forces (COMAFFOR) may have direct authority over some units, but may not have control over other targeting organizations. It is therefore crucial that theater strategists, planners, and targeteers develop the necessary relationships with these units and organizations during peacetime so that intelligence support to targeting and assessment may flow smoothly during contingencies. While theater targeting units can seldom, if ever, directly task federated organizations, they can develop working relationships through which these organizations can provide support the theater needs.

The key to an effective federation system is to know the capabilities of the various units and organizations—Air Force, joint, and national—that can be called upon for support. There are many organizations that can and often do produce intelligence and other information useful to theater targeting and assessment efforts. Such expertise has always been important, but it is essential for an effects-based approach to conflict, which relies on greater situational awareness, more comprehensive planning, and deeper knowledge of the adversary than an attrition-based approach does.

Air operations center (AOC) strategists, planners, targeteers and intelligence analysts are generalists in the sense that they should have knowledge of a wide variety of weapon, target, and political systems. Federated targeting organizations have specialists with extensive knowledge on specific target systems in specific nations. Utilizing this expertise is absolutely necessary if targeteers are to conduct effective target development that imposes the specific effects chosen by planners to achieve commanders' objectives.

There are many kinds of information available to support targeting and assessment efforts. Traditional approaches to both have emphasized imagery intelligence—usually overhead imagery from satellites and reconnaissance aircraft. While imagery is certainly still important, human intelligence (HUMINT), signals intelligence (SIGINT),

measurement and signature intelligence (MASINT), and open-source intelligence (OSINT) can be equally—and sometimes more—important to targeteers and planners. Collaboration with federated organizations may enable analysts to pull together this multitude of intelligence to utilize in targeting.

FEDERATION CLASSIFICATION

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There are two fundamental ways to classify federated support, which affect how relationships are built, help determine how taskings are conveyed, and influence how information is disseminated. All components—Air Force and joint, official and unofficial—are required for effective federation.

Air Force and Joint/National. AOC planners are concerned with two federated systems: one that is internal to the Air Force (also known as reachback) and one that involves joint and national agencies. The Air Force has control over only its reachback capabilities. The joint/national system is based on the needs of geographic combatant commanders (CCDR s) or JFCs. These needs are coordinated with the larger joint community through the JCS intelligence directorate's (J2) Deputy Director for Targeting (J26). However, the COMAFFOR should submit requirements through the combatant commander or joint force commander (JFC) for any joint or national federated support he or she needs. In both cases, federated support should be coordinated prior to hostilities. Such coordination should delineate specific duties to federated partners, establish timelines, and determine the methods of communication to be used. Additionally, whenever possible, COMAFFORs should coordinate federated partner participation in theater exercises. Without proper coordination, federated partners may be unclear of duties once hostilities begin. Exercise participation may reveal points of friction, process errors, and operational limitations that coordination alone may not reveal. Federated partners may also have conflicting priorities if multiple contingencies occur simultaneously in different theaters; as most federated partners are not subordinate to a single, specific theater and solid peacetime working relationships may help reduce the impact of such seams or priority conflicts.

Official and Unofficial. Targeting and assessment are year-round efforts. In the past, many organizations supported theater targeting efforts even though they were not officially part of a federated team. This support was often slow, due to limitations of existing communication technology. Development of the internet and creation of Intelink, however, ushered in a whole new era of federated partnership. Much of the intelligence that was created for and sent to specific theaters in years past is now disseminated to the world via the net. Peacetime federation, therefore, is often informal. During hostilities, however, formal relationships are necessary, since timelines are severely reduced. For instance, National Geospatial-Intelligence Agency creates

imagery-based products daily that can be used for target development, even though they are based on a multitude of requirements other than targeting support. AOC planners can coordinate with NGA to obtain these products, but they require no formal relationship to do so. While the intelligence community is doing its mission, the AOC is simply taking advantage of available resources. During a conflict, however, the AOC's needs may require specific NGA action and be much more time-critical. This may require a formal request for support from the JFC to the NGA. Obviously, if the need can be anticipated and planned for, the partners can accomplish the necessary requests and coordination, which may improve the timeliness and quality of the support. The bottom line is that, while peacetime requirements may be met a less formal federated structure, contingencies dictate that all federation partners know exactly what support is required of them, the timelines involved with providing the support, and in what manner they need to provide it.

TYPES OF FEDERATED SUPPORT

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Federated partners can provide support to many stages of targeting.

Objectives, effects, and guidance. Many federated organizations, both Air Force and joint, have analysts who have studied specific targets, target sets, nations, and regions for many years. Many of the analysts with deepest understanding are civilians working for national intelligence agencies. Their comprehensive expertise may be useful to AOC strategists when developing objectives, effects, and measures of effectiveness.

Target Development. Federated targeting units conduct target development year-round. Theater targeting units can utilize this information, reducing redundancy as well as workload. There are a large number of intelligence and other analytic organizations that specialize in certain targets or target systems. For instance, the Joint Warfare Analysis Center (JWAC) has engineers who specialize in lines of communication, electrical power generation, and POL distribution. DIA's Missile and Space Intelligence Center (MSIC) are experts in surface-to-air missiles. These, and many other organizations, can be called upon to provide expertise for specific targeting efforts. Even if these organizations are not official members of a theater federated targeting effort, they can still be utilized to assist with target development.

Collateral Damage Estimation. While AOC personnel and reachback organizations can conduct most of the effort required to estimate collateral damage, some estimates require advanced estimation methods which only national organizations have the expertise. For example, JWAC and the Defense Threat Reduction Agency (DTRA) have specialists who can assist in this effort.

Weaponeering. Many units specialize in weaponeering for specific munitions or target categories. For instance, the Air Force Targeting Center specializes in weaponeering for the Joint Air-to-Surface Standoff Missile (JASSM) and is the only source for the production of the Target Area Model used for end-game mission guidance on the JASSM. Targeteers at US Strategic Command (USSTRATCOM) specialize in similar activities. Weaponeering is time-consuming; utilizing federated partners to conduct weaponeering frees AOC planners to focus on other critical planning activities.

Point Mensuration. Federated partners can assist AOCs with point mensuration. Because it is so time consuming, mensuration may overwhelm AOC targeteers. Many Air Force and joint units can provide expertise in this area.

Assessment. Partners can assist AOCs in determining appropriate measures of effectiveness (MOE) and in analyzing collected data. Joint and national agencies may be particularly useful in helping make political and economic types of assessment. Ideally, the same units that provide support for target development should also assist with the post-attack assessment of those targets and target sets, regardless of the means of attack. Obviously, analysts who support target development may already have detailed knowledge that can be put to use during assessment. Establishing federated relationships early may help ensure this happens.

The previous list is not all-inclusive. AOC targeteers should understand and utilize all federated specialties available. Understanding the capabilities of all possible federated partners may provide insight into the types of support that are available for use throughout all AOC processes.

THEATER ORGANIZATIONS

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There are numerous organizations that may be called upon to support theater targeting and assessment efforts. It is imperative that AOC targeteers understand the organizations that they can utilize to support AOC targeting efforts, both in peacetime and during wartime.

Air Operations Center. The intelligence, surveillance, and reconnaissance (ISR) division within the AOC provides targeting expertise through the Targets/TA team. This team works with other AOC divisions to ensure continuity of the targeting process. Primary outputs from the Targets/TA team are electronic target folders (ETFs) that contains target data, target materials, weaponeering solutions, collateral damage estimates, and mensurated aimpoints for air component target nomination list (TNL), integrated TNLs, and STAR packages.[1] In addition, theaters have two supporting intelligence organizations: the 480th ISR WG's Distributed Common Ground System (AF DGS) with four supporting nodes, and the 67th Network Warfare Wing's offensive cyberspace operations capability within the 67th Network Warfare Group. These two organizations can provide intelligence and offensive capabilities to support lethal and nonlethal targeting solutions. Further, the director of space forces (DIRSPACEFOR) may be of assistance in coordinating space requirements in support of targeting. When contingency operations exceed available manning and system requirements in the ISR division, the COMAFFOR/JFACC can request reachback support.

Air Force Distributed Common Ground System (AFDCGS). The Air Force has developed an intelligence weapon system to provide enhanced intelligence processing, exploitation, and dissemination (PED) support for worldwide operations. While these units do not typically provide support directly to targeteers, they do provide SIGINT MASINT and IMINT support to theater AOCs that ultimately support targeting and assessment. DCGS provides Planning and direction, collection, processing and exploitation, analysis and dissemination (PCPAD) for a variety of platforms including the U-2, RQ-4 Global Hawk, R/MQ-1 Predator, MQ-9 Reaper, MC-12 Project Liberty, and others.

[1] See Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3122.06, *Sensitive Target Approval and Review (STAR) Process* (classified publication), for more information on sensitive targets.

There are currently five operational DGSs units. While each DGS is regionally aligned to a primary theater for familiarity and situational awareness, the DCGS operates as a single entity and specific DGSs units can be called upon to flex from their primary theater to support a more critical area, as warfighter needs dictate. Targeteers should keep this in mind when the ISRD request (PCPAD) support from AF DCGS. AF DCGS is not part of a theater AOC or a theater's assigned forces. However, AF DCGS products, reporting, and support can prove beneficial to AOC joint intelligence preparation of the operational environment (JIPOE), targeting, collection management, and assessment efforts.

National Tactical Integration (NTI). The Air Force NTI team embedded in the AOCs makes available a cadre of expertise to provide substantive and timely reachback and integration of national SIGINT to inform and enhance targeting, planning, operations, and force protection.

JOINT AND NATIONAL ORGANIZATIONS

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Theater Joint Intelligence Operations Center (JIOC) or Joint Analysis Center (JAC). The theater JIOC (or JAC in US European Command) is the central point for theater intelligence tasking, collection, analysis, and production. JIOCs also have targeting offices that produce target folders based on deliberate planning taskings. In addition, JIOCs, in coordination with theater J-2s, maintain the joint target list (JTL), no strike list (NSL), and restricted target list (RTL) for specific operations plans (OPLAN s) or concept plans (CONPLANs). JIOCs have liaisons from the major national intelligence agencies to facilitate effective national intelligence support to the theaters. These liaisons typically include personnel from DIA, NGA, the National Security Agency (NSA), and the Central Intelligence Agency (CIA). The roles of these organizations are explained later in this appendix.

Theater Cruise Missile Support Agency (CMSA). CMSA-Pacific (Camp Smith, Hawaii) and CMSA-Atlantic (Norfolk, Virginia) can provide valuable targeting information for Tomahawk Land Attack Missile (TLAM) employment (seaborne).

Global Cryptologic Center (GCC). A GCC is an NSA site to ensure NSA-derived intelligence supports theater planning, force employment, and assessment. AOC planners can coordinate with the GCC or go through the theater NSA representative at the JIOC (the Cryptologic Support Group); but a theater can't directly task a GCC—it must go through NSA. However, planners can consult with their theater's supporting GCC. There are three US-based GCCs, each with a focus on a specific theater, or multiple theaters.

National Intelligence Support Team (NIST). A NIST is a team composed of personnel from DIA, NSA, NGA, CIA, or other national intelligence agencies that is deployed, upon request by a JFC, to facilitate the flow of timely all-source intelligence between his JTF and interagencies during crises or contingency operations. The NIST concept is designed to create a dynamic flow of intelligence to and from the JTF operational area. The NIST provides reachback to national intelligence agencies and provides the JFC and his staff with knowledge of each agency's resources and capabilities that normally does not exist at the JTF level. Team members provide a direct agency liaison for the JTF, and have an understanding of where to go in their parent agency to obtain the best support for the commanders' priority intelligence requirements.

AIR FORCE CONUS ORGANIZATIONS

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Headquarters USAF

HQ USAF. AF/A2 and AF/A3/5 are the focal points for coordinating the Air Force's CONUS-based targeting and assessment reachback support.

Air Force Network Operations and Security Center (AFNOSC). The AFNOSC provides the commander of Air Force network operations the means to ensure the security, integrity, and timely delivery of ISR information transiting the Air Force enterprise network. The AFNOSC directs activities of the regional NOSCs and wing-level network control centers to ensure integrity of the Air Force segment of the Global Information Grid. Health of the network directly impacts targeting capability.

The Air Force ISR Agency (AFISRA).[1] Provides multisource ISR products, applications, capabilities and resources, to include cyber and geospatial forces and expertise. Additionally, it is the Service Cryptologic Component responsible to the National Security Agency and Central Security Service for Air Force matters involving the conduct of cryptologic activities, including the full spectrum of missions directly related to both tactical warfighting and national-level operations. The 480th ISR Wing operates and maintains the DCGS Weapons System including the five active DGS sites around the world. This includes the DGS Analysis and Reporting Teams (DARTs) at each DGS that provide DGS-based analytic support to the ISRDs and JIOCs.

The 70 ISRW conducts worldwide, real-time cryptologic and geospatial-intelligence missions for ongoing air, space and cyberspace operations. This includes the AF National-Tactical Integration mission that leverages the national intelligence community's global enterprise to provide actionable intelligence to the ISRDs.

National Air and Space Intelligence Center (NASIC) is the sole national center for integrated intelligence analysis on air, space, and cyber systems, forces, and threats. It assesses current and projected foreign air, space, and cyberspace capabilities and intentions; produces scientific and technical intelligence (S&TI) reports that can be utilized to augment targeting and mission planning; and evaluates evolving technologies

[1] AFISRA changed to 25 AF; http://www.25af.af.mil/library/factsheets/factsheet.asp?id=21937 . This will be updated in the next revision to this annex.

of potential adversaries. Such technical information is useful in determining how to create specific effects on specific targets and target systems. In addition to expertise on worldwide air assets, NASIC provides expertise on adversarial air capabilities also has resident expertise on adversarial ballistic missiles (> 1000 km), space systems, and cyber operations.

Air Combat Command (ACC)

ACC Intelligence Directorate (ACC/A2) plays a large part in coordinating the Air Force's CONUS-based reachback support, as many organizations involved are subordinate to ACC.

The Air Force Targeting Center (AFTC)[2] is the Air Force center of excellence for targeting. The AFTC maintains a core capability for expert targeting reachback support for air expeditionary forces, MAJCOMs, Component NAFs, and combat wings. It enables the integration of capabilities across air, space, and cyberspace to deliver precise, coercive effects through, all source analysis, target analysis and production, GEOINT products, unit targeting support, and specialized targeting training. The AFTC leverages the Air National Guard (ANG) and Air Force Reserve Command (AFRC) to meet critical targeting and production requirements. AFTC's major targeting production activities include:

- Target System Analysis
- Electronic Target Folders
- Target Materials
- Precise Point Mensuration (PPM)
- Weaponeering
- Collateral Damage Estimations (CDE)
- CALCM/JASSM targeting
- BDA
- Geospatial Intelligence Support

Air National Guard (ANG) Targeting Production and Analysis Units

The Air Force has developed specific ANG units to provide the Air Force Targeting Center a surge-to-war target production capability accomplished through the use of imagery analyst, targeteering analyst, and intelligence applications. These ANG units also provide local, state, and federal authorities a domestic IAA damage assessment of critical infrastructure key resources during homeland defense and homeland security missions.

[2] AFTC has been redesignated and their mission realigned under 25 AF. This will be updated in the next revision to this annex.

Air Force Space Command

Air Force Space Command has deep expertise in space and cyberspace operations which can prove useful when analyzing and targeting enemy space and cyberspace capabilities. Targeteers at the 614th AOC and 624th Cyber Operation Center evaluate theater AODs and nominate space- and cyberspace-related targets to meet a theater commander's objectives.

Air Mobility Command (AMC)

AMC Intelligence (AMC/A2) maintains databases on airfields worldwide in the event AMC must utilize those bases. Such information may be useful when targeting enemy airfields.

Air Force Materiel Command

Air Force Life Cycle Management Center, Armament Directorate is responsible for the development, acquisition, testing, deployment, and sustainment of all non-nuclear air-delivered weapons. The information they provide may be beneficial during weaponeering and conducting munitions effectiveness assessments.

JOINT AND NATIONAL CONUS ORGANIZATIONS

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Joint Chiefs of Staff (JCS)

J-2 Intelligence Directorate, Deputy Director for Targeting (J26). The J-2 is the national level focal point for crisis intelligence to support military operations as well as warning intelligence. J26 is the coordinator for all joint and national federation needs of a unified command or JTF. AOC targeteers should coordinate their federation needs with the MAJCOM or NAF A-2, who may then coordinate with the JFC's J-2. However, the AOC should first determine which of its needs can be met by utilizing Air Force reachback partnerships.

National Agencies

Defense Intelligence Agency. The JCS J-2 is dual-hatted as the Director of DIA. DIA is a major producer and manager of foreign military intelligence with a worldwide outlook. DIA is normally the first stop when analysts need foreign military intelligence to support targeting and assessment. In addition to the main DIA Center in Washington, DC, DIA maintains two specialized intelligence centers, the Missile and Space Intelligence Center and the National Center for Medical Intelligence.

Missile and Space Intelligence Center (MSIC) provides worldwide scientific and technical intelligence concerning threat guided missile systems, directed energy weapons, selected space programs/systems and related C3 to support operationally deployed forces. MSIC has experts knowledgeable on SAMs as well as short-range ballistic missiles.

National Center for Medical Intelligence (NCMI) produces finished, all-source medical intelligence in support of military planning and operations. Assessments, forecasts, and databases are prepared on worldwide infectious disease occurrence, global environmental health risks, foreign military and civilian health care capabilities and trends, and militarily significant life science technologies.

National Geospatial-Intelligence Agency (NGA) is the primary national producer of geospatial-intelligence, which is the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically

referenced activities on the earth. Products include controlled imagery, digital elevation data and selected feature information, which can be rapidly augmented and fused with other spatially referenced information such as intelligence, weather and logistics data resulting in an integrated, digital view of the mission space. NGA also produces many of the maps and charts Airmen utilize for mission planning.

National Security Agency (NSA) employs mathematicians, linguists, engineers, and computer scientists focusing on information assurance and SIGINT. NSA's employees collect, process, analyze, and exploit adversaries' communications. NSA maintains its headquarters at Fort Meade, Maryland and has three global cryptologic centers, each with a regional focus.

Defense Threat Reduction Agency (DTRA) is a combat support agency charged with developing methods to deal more effectively with threats by nuclear, radiological, chemical, biological, and high explosive weapons of mass destruction and preventing future threats. The agency focuses DOD efforts to prepare for and respond to WMD attacks. These technologies provide commanders options for effective targeting against enemy WMD capabilities, WMD delivery methods, and underground or hardened structures, as well as enhanced capabilities to assess enemy WMD operations.

Defense Information Systems Agency (DISA) is a combat support agency responsible for planning, engineering, acquiring, fielding, and supporting global net-centric solutions and operating the Defense Information System Network. DISA seeks to guarantee our forces global information dominance by providing jointly interoperable systems that have assured security, survivability, availability, and superior quality. Because of DISA's expertise in developing, maintaining and protecting US information methods, they may prove useful in developing targeting strategies to attack enemy information methods and systems.

Unified Commands

Functional Unified Command Joint Intelligence Operations Centers. The CONUS-based functional unified commands—USSTRATCOM, US Transportation Command (USTRANSCOM), and US Special Operations Command (USSOCOM)—each have a JIOC. Each of these unified commands has a global outlook and, as such, are capable of providing targeting and assessment support to combatant commands worldwide in the areas of special operations, transportation, WMD, space, nuclear forces, and information operations, to name a few.

United States Cyber Command (USCYBERCOM). USCYBERCOM plans, coordinates, integrates, synchronizes and conducts activities to: direct the operations and defense of specified DOD information networks and; prepare to, and when directed, conduct full spectrum military cyberspace operations in order to enable actions in all domains, ensure US/Allied freedom of action in cyberspace and deny the same to our adversaries.

Joint Warfare Analysis Center (JWAC). A component of USSTRATCOM, JWAC provides planners with specialized lines of communications analysis for use in

developing targeting strategies. JWAC provides innovative and accurate engineering and modeling-based targeting options with an understanding of risks and consequences, including collateral damage estimates.

Joint Information Operations Warfare Center (JIOWC). Subordinate to joint staff, this center is responsible for the integration of information operations (IO) into military plans and operations across the range of military operations. The center provides direct command and control warfare (C2W) tactical and technical analytical support to operational commanders. The center supports the integration of operations security, military information support operations (MISO), military deception, electronic warfare and destruction throughout the planning and execution phases of the operations. Direct support is provided to unified commands, JTFs, functional and service components, and subordinate combat commanders. The center maintains specialized expertise in C2W systems engineering, operational applications, capabilities and vulnerabilities.

Joint Space Operations Center (JSpOC). The JSpOC is the primary USSTRATCOM interface for space effects to the supported commander, to include all aspects of deliberate planning, CAP, adaptive campaign planning, and the air tasking cycle. The JSpOC is responsible for analyzing and targeting enemy space capabilities in support of theaters in addition to their global mission. JSpOC targeteers can evaluate theater AODs and nominate specific space-related targets to meet a theater commander's objectives.

USSTRATCOM JAOC (608 AOC). The mission of the 608 AOC is to support USSTRATCOM Deterrence and Global Strike missions by developing integrated plans; directing, synchronizing, and monitoring execution; and assessing deterrence and global strike options in response to a full range of global threats in order to meet the CCDRs' guidance and objectives. Global strike options are rapidly planned, limited-duration, extended-range precision attacks to achieve strategic objectives. The 608 AOC is prepared to provide the full range of command and control functions over assigned and attached forces. The 608 AOC conducts planning and integration with USSTRATCOM component commands and organizations, other combatant commands, AOCs, and when authorized non-DoD partners, to ensure unity of effort in support of military and national security operations, as well as support to civil authorities.

Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME) is a joint activity that develops operational effectiveness estimates and collateral damage estimates for all non-nuclear munitions and continuously updates JMEMs used by the Services for training and tactics development, operational targeting, weapons selection, aircraft loadouts, and planning for ammunition procurement, survivability, and development of improved munitions. JTCG/ME directs the analytical effort of working groups necessary to determine degrading effects of various terrain environments on non-nuclear munitions effectiveness and improving the database for target vulnerability, delivery accuracy, and weapons characteristics. JTCG/ME promotes and develops standardized procedures and models used by the Services and the munitions industry for the evaluation of non-nuclear munitions effectiveness and conducts special studies concerning munitions effectiveness.

JTCG/ME is managed through the JTCG/ME program office within the Army Materiel systems Analysis Activity at Aberdeen Proving Grounds, Maryland. Part-time participants from the various Services are organized into working groups that represent the major areas of interest. These groups include air-to-surface, surface-to-surface, anti-air, target standardization, special effects, and information operations.

Sister Services

The US Army maintains an intelligence collection and analysis structure that Airmen may use when conducting operations. The Intelligence and Security Command (INSCOM) provides a wide variety of ground-based intelligence through its main production center, the National Ground Intelligence Center (NGIC).

The US Navy also maintains an intelligence collection, analysis, and production structure that Airmen may use when conducting operations. Navy intelligence has a focus in many ways similar to Air Force intelligence. There are three main organizations that Airmen can utilize for targeting and assessment support. The Office of Naval Intelligence's (ONI) main production center is the National Maritime Intelligence Center (NMIC).

US Marine Corps through the Marine Corps Intelligence Activity (MCIA), provides tailored intelligence based on expeditionary profiles in littoral areas.

Non-Military Organizations

Central Intelligence Agency (CIA) gathers, analyzes, and produces most of the nation's HUMINT. HUMINT may be able to provide targeteers with information not available through other intelligence collection methods. This may be particularly important in the case of terrorist organizations, which are often distributed networks with limited physical infrastructure. HUMINT is absolutely essential for analysis of such organizations.

Department of State, Bureau of Intelligence and Research (INR). As the lead foreign affairs agency and the enabler of US diplomacy, the State Department has a unique perspective on the nations of the world. Such insight, as collected, analyzed, and produced by INR, can be extremely influential when planning, executing, and assessing military operations. Intelligence concerning political and military leaders, cultural trends and thoughts, and economics—to name just a few areas—can give Airmen intelligence that ties military strategy to the entire spectrum of national power, which can be essential for a truly effects-based approach to conflict. Even from a purely military standpoint, such intelligence can enhance understanding of adversary motivations, helping to influence or bend them to our way, the ultimate goal in any operation.

Department of Homeland Security (DHS). Encompassing Citizen and Immigration Services, Customs and Border Patrol, Transportation Security, the Secret Service, and the Coast Guard, DHS, with its three primary missions—prevent terrorist attacks within the United States, reduce America's vulnerability to terrorism, and minimize the damage from potential attacks and natural disasters—has a wealth of intelligence on enemies,

and potential enemies, of the United States. Although DHS looks "inward," airpower planners may be able to utilize DHS-derived intelligence when it leads to foreign-based terrorist organizations and infrastructures.

Department of Justice (DOJ). With subordinate organizations such as the Federal Bureau of Investigation and the Drug Enforcement Administration, DOJ-derived information, like that of the DHS, may help focus targeting efforts when it leads to foreign-based terrorist organizations and infrastructures.

The Department of Energy, Office of Intelligence and Counterintelligence provides timely technical intelligence analysis on all aspects of foreign nuclear weapons, nuclear materials and energy issues worldwide.

Department of Treasury. The Office of Foreign Assets Control (OFAC) of the US Department of the Treasury administers and enforces economic and trade sanctions based on US foreign policy and national security goals against targeted foreign countries and regimes, terrorists, international narcotics traffickers, those engaged in activities related to the proliferation of weapons of mass destruction, and other threats to the national security, foreign policy or economy of the United States

The Drug Enforcement Administration shares any drug-related intelligence with the IC that is acquired while executing their drug enforcement duties.

The Federal Bureau of Investigation is tasked with understanding threats to our national security and penetrating national, as well as transnational, networks that wish to and are capable of harming the United States. They focus on terrorist organizations, foreign intelligence services, weapons proliferators, and criminal enterprises.