CJCSI 3162.02
8 March 2019

METHODOLOGY FOR COMBAT ASSESSMENT

JOINT STAFF

WASHINGTON, D.C. 20318

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CHAIRMAN OF THE JOINT CHIEFS OF STAFF INSTRUCTION

J-2 CJCSI 3162.02
DISTRIBUTION: A, B, C, S 8 March 2019

METHODOLOGY FOR COMBAT ASSESSMENT

References: See Enclosure I

1. Purpose. This instruction establishes the methodology for conducting the three components of Combat Assessment (CA) that may result in a re-attack recommendation (RR): battle damage assessment (BDA), collateral damage assessment (CDA), and munitions effectiveness assessment (MEA). It provides analysts with the definitions, methodology, and principles of reporting required for CA. It bridges the gap between doctrinal guidance provided in Joint Publications (JPs) and Combatant Commands' (CCMDs') CA programs.

2. Superseded/Cancellation. This instruction cancels and replaces Chairman of the Joint Chiefs of Staff (CJCS) Manual 3162.01A, 15 December 2016, "Joint Methodology for Battle Damage Assessment."

3. Applicability. This instruction applies to the Joint Staff (JS), Services, CCMDs, Joint Forces, Department of Defense (DoD) Combat Support Agencies (CSAs), and joint activities conducting CA for use in joint or coalition operations. As this instruction does not apply to third-party damage estimates; use the damage definitions in Enclosure H for damage assessments where U.S. forces do not conduct strikes.

4. Procedures. This instruction provides the methodology for CA. This instruction's review process establishes processes for evaluating the effectiveness of new weapons or capabilities.

5. Summary of Changes

a. Expansion of the BDA methodology into a CA methodology.

b. Establishes BDA databasing and graphic production standards.

c. Establishes a CDA methodology, including databasing and graphic production standards.

d. Establishes a MEA methodology, including databasing and graphic production standards.

e. Establishes a RR methodology, including databasing standards.

f. Replaces "Joint Staff Targeting and Facilitation Cell" with "Joint Staff Targeting Integration Cell (JSTIC)."

g. Updates glossary with new definitions provided in reference c.

6. Releasability. UNRESTRICTED. This instruction is approved for public release; distribution is unlimited on the Non-secure Internet Protocol Router Network (NIPRNET). DoD components, to include CCMDs, other Federal agencies, and the public, may obtain copies of this directive through the CJCS Directives Electronic Library < http://www.jcs.mil/library>. JS activities may obtain access via the Secure Internet Protocol Router Network (SIPRNET) Directives Electronic Library website.

7. Effective Date. This INSTRUCTION is effective upon receipt.

For the Chairman of the Joint Chiefs of Staff:

M. M. GILDAY
VADM, U.S. Navy
Director, Joint Staff

Enclosures
A — Responsibilities
B — The Joint Targeting Cycle and Combat Assessment
C — Battle Damage Assessment Methodology
D — Collateral Damage Assessment Methodology
E — Munitions Effectiveness Assessment Methodology
F — Re-attack Recommendation Methodology
G — Post-campaign Operations Actions
H — Damage and Change Definitions
I — References
GL — Glossary

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ENCLOSURE A

RESPONSIBILITIES

1. Combatant Commands. CCMDs complete CA as part of their assigned target intelligence production responsibilities. Although a joint force commander (JFC) may leverage external production capacity as part of a federated BDA enterprise, the CCMD retains overall CA responsibility.

a. CCMDs, which are assigned battlespace and objectives through the Contingency Planning Guidance, will conduct CA for target engagements within their battlespace.

b. CCMDs may task subordinate forces to conduct CA. In situations when the JFC may not have the targeting capacity to conduct CA, the parent command may delegate select responsibilities to the subordinate joint forces. The CCMDs may also delegate CA responsibilities to subordinate components or functional component commands.

c. If joint forces cannot fulfill their CA analysis and production responsibilities, they must task assigned, attached, and supporting organizations with specific requirements and manage those tasks to ensure the products meet requirements.

d. Joint forces will document CA production, responsibilities, and tasks in published plans and orders, typically in Appendix 4 (Targeting) to Annex B (Intelligence) of the plan or operation.

e. CCMDs, joint forces, and Service components should publish supplementary CA guidance for theater/functional specific requirements in accordance with the minimum CA standards articulated in this instruction.

f. Any product content, format, and/or processes beyond the minimum CA standards outlined in this instruction, documents referenced in this instruction, or related CJCS publications remain the responsibility of the joint force or authorized functional command.

g. CCMDs will provide the Joint Technical Coordinating Group/Munitions Effectiveness (JTCG/ME) with operational strike logs and BDA reports on a regular basis, as determined by the JFC or delegated authority. Whenever practicable, provide JTCG/ME with access to relevant data accessible through Joint Targeting Toolbox, National Production Workshop, and the Modernized Integrated Database (MIDB). Instruct their sub-unified commands, joint task

forces (JTFs), and component commands to provide the similar access as needed.

h. CCMDs, sub-unified commands, component commands, and JTFs will provide JTCG/ME with access to pre- and post-strike data, to include, but not limited to, target packages, electronic target folders (ETFs), mission reports (MISREPs), and strike videos.

i. CCMDs facilitate the release and disclosure of CA-related operational data to allies and coalition partners. Provide classification, use, control, and dissemination policy guidance to U.S. government, allied, and coalition partner organizations supporting the planning and execution of U.S. led-contingencies or combat operations.

2. Services

a. Service members assigned to joint operations centers and targeting work centers to perform any CA skill—BDA, MEA, and RR—to support the Joint Targeting Cycle (JTC) must receive skill training in advance.

b. Service supporting operational organizations will provide CA support to CCMDs and joint force service components when requirements are documented through the joint planning processes (JPP) or in published plans or orders. Service intelligence centers will support development of all products associated with BDA in support of CA, to include acting as federated support to the production of BDA Phase 1 and 2.

c. Services will provide JTCG/ME with weapons characteristics data needed to assess weapons effectiveness, including munition performance parameters (e.g., net explosive weights or *z*-data files), weapon delivery accuracy parameters, and expenditures reports.

3. Combat Support Agencies

a. CSA members assigned to joint operations centers and targeting work centers to perform any CA skill—BDA, MEA, and RR—to support the JTC must receive skill training in advance.

b. JFCs may task CSAs to produce products to support CA within their areas of expertise. However, the JFC's staff is responsible for ensuring the CA produced meets the JFC's requirements. CSAs will document in published plans or orders, or through the JPP, requirements to provide federated CA capabilities in support of the joint force.

c. National Geospatial-intelligence Agency (NGA). NGA provides timely, relevant, and accurate imagery, imagery intelligence, and geospatial

information. This includes functional management and federated reach-back support to numerous joint targeting processes involving exploitation of geospatial intelligence (GEOINT), including support to CA.

(1) NGA supports the federated BDA process as agreed upon in a supported command's BDA concept of operations (CONOPS).

(2) NGA provides national imagery collection management for conventional National Technical Means (NTM) and commercial imagery sources and non-imagery sources such as Overhead Non-imaging Radar. The agency provides advisory tasking for theater and tactical assets to meet national intelligence requirements (see reference k).

(3) NGA can provide specialized geospatial and graphics support for MEA on a limited basis to address specific issues (see reference i). The MEA graphic (MEA-G) requestor and NGA will coordinate to ensure required data is included in the final product. NGA can produce MEA-Gs to support two functions: accuracy assessment (requiring the requestor to provide all needed information about the munition's intended aim point), and evaluation of geospatial source data.

(4) NGA facilitates the release and disclosure of GEOINT to allies and coalition partners. NGA provides GEOINT classification, use, control, and dissemination policy guidance to U.S. government organizations supporting the planning and execution of contingencies or combat operations (see reference k).

4. Defense Intelligence Analysis Program and Responsible Producers

a. The Defense Intelligence Analysis Program (DIAP) assigns analytic responsibilities, i.e., the responsible organization and responsible producers (RESPROD). RESPROD is an authority assignment given to a responsible organization to create and modify MIDB records. See references a and b for more details.

b. The joint force responsible for BDA may not have the authorities to create and modify MIDB records. Regardless, the joint force, through the CCMD J2, must provide BDA products to the DIA DIAP program manager. RESPRODs are responsible for reviewing BDA and reflecting changes to MIDB records based on joint force-provided BDA. This will ensure that the target records accurately reflect the current condition, status, and activity.

c. During combat targeting operations, the joint force may request RESPROD authorities for MIDB records related to targets within its joint operations area; however, the original RESPROD retains final decision authority. The shared authority between RESPROD and the joint force to update, modify, or amend MIDB records ensures effective operational use of

the records for BDA purposes by ensuring the records reflect the latest and most accurate intelligence assessment of operational status. See references a and b for more details.

5. Joint Technical Coordinating Group for Munition Effectiveness. JTCG/ME directs working groups focused on specific aspects of weaponeering, weapon effects, and collateral damage.

a. JTCG/ME will gather and analyze operational strike data from the CCMDs, sub-unified commands, JTFs, component commands, and Services.

b. JTCG/ME will develop and maintain a web-accessible repository to ensure that data is available to the operational community for use in CA activities. JTCG/ME will use the data in this repository to support Joint Munitions Effectiveness Manual (JMEM) validation, weapon performance and expenditures analysis, and training of operational users in the use of JTCG/ME products.

6. Joint Staff Targeting Division (J-234). The Joint Staff Targeting Division, hereafter referred to as JS Targeting, is responsible for the CA policy and guidance development for the CJCS.

a. JS Targeting addresses CA issues worldwide in scope or involving cross-CCMD coordination. JS Targeting fulfills this role via the Military Targeting Committee (MTC), in collaboration with the CCMDs, Services, JS, and intelligence community (IC). See reference l for more details on the MTC.

b. Upon CCMD request, JS Targeting coordinates BDA federation. Coordinate this assistance via the intelligence planning or federated production request process or the JSTIC when established in support of a JS crisis management team.

ENCLOSURE B

THE JOINT TARGETING CYCLE AND COMBAT ASSESSMENT

1. Introduction. Targeting is the process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. The JTC is an iterative process that provides a framework to describe the required steps to conduct joint targeting. It provides the commander with a methodology linking objectives with effects. The targeting process provides a logical progression as an aid to decision making and ensures consistency with the commander's objectives. While CA is formally Phase 6 of the JTC, CA coordination, management, and production occur throughout the cycle. The following paragraphs explain how CA fits into the JTC. For a detailed explanation of the JTC phases, refer to reference c.

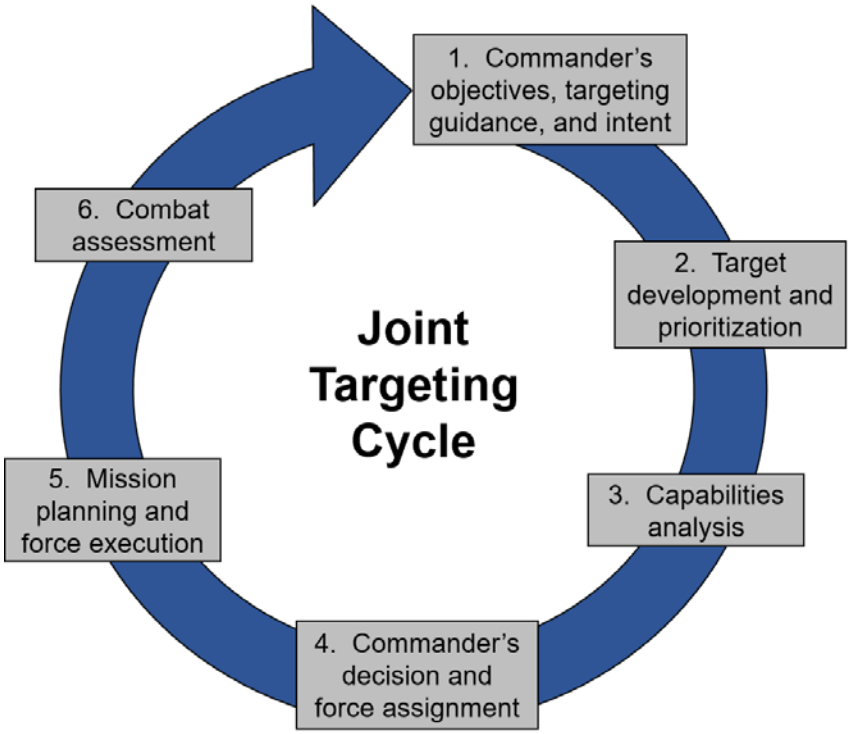

Figure 1. The JTC

2. Phase 1—Commander's Objectives, Targeting Guidance, and Intent. Understanding the commander's objectives and desired end states is the first and most important step of joint targeting. End states, objectives, desired effects, mission sets, operational environment, and identified centers of gravity can be found in operations plans (OPLANs), base plans, or CONOPS. The end state outlines the conditions required to achieve of military objectives for the operation. Base the commander's desired effects on these military objectives.

Attainment of clear, measurable, and achievable objectives will enable the joint force to achieve the desired end state. The outputs from this phase provide the criteria for the conduct of BDA. **Develop observable, achievable, and reasonable measures and indicators, including targeting measures of effectiveness (MOEs) and targeting measures of performance (MOPs) to assess the outcome of operations. Understanding these measures and indicators enable effective CA.** The J2, J3, J5, and joint fires element (JFE) share responsibility for MOP development and the review of draft plans and orders during Phase 1 of the JTC.

a. A MOP is a criterion used to assess friendly actions in accomplishing tasks—"Are we doing things right?" MOPs evaluate the task performance of tactics, techniques, and procedures (TTP). Derive targeting MOPs from the general operational MOPs.

b. A MOE is a criterion used to assess changes in system behavior, capability, or operational environment in measuring the attainment of an end state, achievement of an objective, or creation of an effect—"Are we doing the right things?" MOEs evaluate task results. Derive targeting MOEs from the general operational MOEs.

3. Phase 2—Target Development and Prioritization. Target development entails the systematic examination of potential target systems (their components, individual targets, and target elements) to determine the type and duration of action that must be exerted on each target to create the desired effect(s) consistent with the commander's objectives. For more information on target development, see reference b.

a. Successful CA depends on accurate documentation of analytical production in Phase 2 of the JTC. It is impossible to assess the efficiency and accuracy of targeting without a deep understanding of the logic and information that drove its planning and execution.

b. Phase 2 provides the necessary target data to assess the effect of a target engagement on the target element(s), the target's function, and the target system. CA relies heavily on the target materials produced during this phase. Additionally, Target System Analysis (TSA) produced in this phase provides the baseline for Target System Damage Assessments (TSDAs) conducted in Phase 6.

c. CA analysts should coordinate with target development analysts to ensure that developed target data provides sufficient detail to assess engagement results. TSA and TSA-like products allow efficient development of MOEs required for target assessment.

d. CA analysts and target developers should coordinate to document BDA indicators and/or essential elements of information for each target developed to facilitate CA production efforts. Target developers possess expertise in their assigned target systems and can determine this critical data.

4. Phase 3—Capabilities Analysis. Capabilities analysis evaluates available capabilities against target elements, desired effects, and military objectives to determine the appropriate options available to the JFC. Once the staff develops appropriate options, evaluate specific capabilities against identified critical elements to estimate effects. Effects estimates include estimated repair and recuperation times. CA depends on desired weapons effects and target response estimates (e.g., repair and recuperation times).

a. The target graphics produced during Phase 3 include information used in CA, i.e. critical elements, aim point selection, and collateral damage estimations (CDEs) or collateral effects estimates. Use aim points produced in Phase 3 in CA to compare the planned and actual capability effects.

b. Use weaponeering solutions developed in Phase 3 to develop the estimated damage assessment (EDA). Weaponeering solutions provide critical situational awareness of the performance of the published solution compared to post-strike effects. This enables analysts to refine solutions for future engagements and identify limitations.

c. Each weaponeered capability may have unique effects and corresponding signatures that must be collected to ascertain the intended effects upon the target. The weaponeered solutions in this phase provide guidance on the desired effects, associated collection requirements, and data needed to support an assessment.

d. Phase 3 feeds assessments in CA, including BDA and MEA. The J3 or JFE conduct MEA, and the responsible units should report MEA and RR as part of the CA.

5. Phase 4—Commander's Decision and Force Assignment. In this phase, match the best available weapon, asset, delivery platform, and delivery tactics to specific aim points on the target. Consider operational realities, such as the ability of the weapon to reach the target, the availability of sufficient weapons, weaponeering results, and collateral damage.

a. CA analysts require the published commander's intent to accurately understand critical elements of targets or target systems. Proper knowledge of commander's objectives and targeting guidance will provide the CA analyst with insight into the JFC's operational employment decisions and expectations.

b. Tasking orders and documentation produced in this phase provide a definitive record of intended targets and effects to serve as a starting point for detailed CA planning. Coordination for intelligence, surveillance, and reconnaissance (ISR) collection to support post-strike assessments occurs during Phase 4 of the JTC and requires data points, i.e., target locations, engagement timing, and commander's priorities.

6. Phase 5—Mission Planning and Force Execution. Phase 5 prepares input for and supports the actual tasking, construction, and subsequent execution of missions for weapon systems.

a. CA depends on tactical mission planning products and/or near-real-time execution reporting. "5W" reporting, post-mission debriefings, MISREPs, route or flight plans, in-flight reporting, and full motion/aircraft/weapons system video of the engagement provide valuable CA inputs. Additionally, products derived from open-source, signal, geospatial, and human intelligence, may provide valuable insight to target damage/change. Operations units must provide this information to CA analysts to facilitate timely and accurate CA. Specify CA reporting requirements in policy, plans, and orders to ensure adherence.

b. This phase provides mission-specific operational data used to plan intelligence collection and perform CA. During tactical mission planning, capabilities and logistical constraints may force units to alter the "ideal" weapons/aim points or omit tasked targets. Failure to integrate these changes into the CA plan may waste resources and decrease the accuracy of assessments. Typically, disseminate changes of this nature via tactical reporting.

c. Dynamic targeting normally uses the "find, fix, track, target, engage, and assess" process. In this context, the term assess refers to confirming weapon impact and an initial estimate of the damage. The operational unit engaging the target usually provides the bomb hit assessment (BHA) or weapon hit assessment (WHA), rather than the organization conducting the CA. The executing force should reference the Defense Intelligence Agency's Physical Vulnerability and Critical Elements Guide when providing the executing commander with an accurate initial estimate.

d. Make every effort to document data generated in JTC Phase 1-5 in order to assist in CA. Some execution data is perishable. If the joint force does not record and store execution data in a retrievable manner, then portions of the CA may be delayed or prevented, especially MEA.

7. Phase 6—Combat Assessment. Phase 6 assesses the effectiveness of the targeting from the previous five phases (namely the interdependent target development and target engagement processes) and informs planners who

decide whether and how to adjust the end state and/or the commander's objectives. JP 5-0 defines assessment as "the continuous monitoring and evaluation of the current situation and progress of a joint operation toward mission accomplishment." Some joint operations require no targeting (e.g., Civil Support or Foreign Humanitarian Assistance). In these cases, assessment is required, but CA is not, since Phase 6 of the JTC does not conduct campaign assessment—only an assessment of the targets and target systems.

a. The three components of an engagement are: effect on the target; effect on the surrounding environment; and performance of the operational capability. The three components of CA that may result in a recommendation for re-attack are (Figure 2): J2 personnel conduct BDA to assess the effects on the target element/target/target system; J2, J3, and JFE personnel conduct CDA to assess the damage outside the target boundary; and J3 and JFE personnel conduct MEA to assess fires in terms of weapon system and munitions effectiveness. MEA results can identify and recommend required changes to the methodology, tactics, weapon system, munitions, fuzing, and weapon delivery parameters to increase force effectiveness. Intelligence and operations personnel develop the RR.

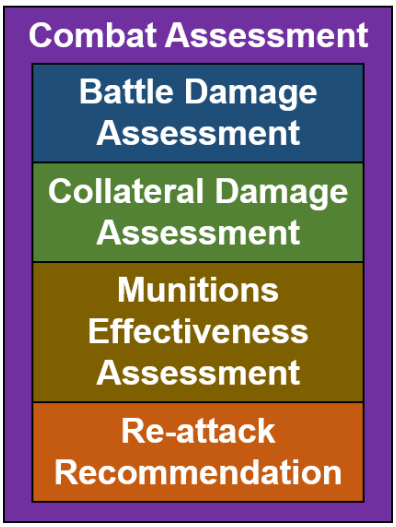

Figure 2. Components of the CA

b. CA and the Levels of War. Conceptually, CA consists of national-strategic, theater-strategic, operational, and tactical-level assessments. Typically, the JS provides national strategic CAs to national decision makers. Theater-strategic and operational-level assessments use MOEs and MOPs to assess progress toward accomplishing targeting objectives and targeting tasks. Use these assessments with other factors to evaluate theater campaign progress. Tactical-level assessments help shape ongoing, daily targeting operations and inform the JFC's decision-making processes.

(1) At the national-strategic level, CAs provide the President, Secretary of Defense, CJCS, and CCMDs with the status of efforts to fulfill national strategy and national military objectives and guidance. These CAs vary, depending on requirements and audiences. In some cases, tactical-level CA products may be required, while in other cases, tailored strategic products may be needed.

(2) Theater-strategic and operational-level CAs use theater-strategic and operational-level targeting MOEs and MOPs to determine progress toward accomplishing the JFC's targeting objectives and targeting tasks. These types of CAs may also vary in style and content from CONOPS-tailored tactical-level CA products. Typically, the joint force depends the most on CAs because the reports answer the question: "Were the JFC's operational objectives met as a result of the forces employed against the selected targets?" CAs informs the planning and execution of ongoing operations and the JFC's decision-making process. The JFC's Red Team should participate in assessments to provide an independent assessment of the likely effects of physical and functional damage on the adversary's perceptions. The Red Team's assessment of the adversary's mindset may shape operational objectives designed to change the enemy's behavior.

(3) Battle Damage Assessment. A component of CA, BDA is as the estimate of damage composed of the physical damage assessment (PDA) and functional damage assessment (FDA), as well as target system assessment, resulting from the application of lethal or nonlethal military force. BDA is composed of Phase 1 BDA (Physical Damage/Change Assessment), Phase 2 BDA (Functional Damage/Change Assessment), and Phase 3 BDA (TSDA). Phase 1 and 2 BDA can be done concurrently in one BDA product. BDA is primarily a J2 responsibility with inputs from the J3 and JFE. Enclosure C details BDA.

(a) Phase 1 BDA, Physical Damage and Change Assessment

1. In Phase 1 BDA, provide a quantitative assessment of physical damage (i.e., percentage damaged) to a target element resulting from the application of fires. Base this assessment on observed, interpreted, or estimated damage resulting from the coupling of capability effects to target vulnerabilities. Lethal and non-lethal capabilities may cause physical damage. Effects resulting in physical damage are usually immediate and easily recognizable.

2. The change assessment measures change to the target resulting from fires that do not create physical damage. Change relates to a condition, behavior, or degree of freedom resulting from an action, set of actions, or another effect. The capabilities that drive change assessments may not result in immediate or easily recognizable effects. Include the level of confidence for the physical and change assessments in the BDA.

(b) Phase 2 BDA, Functional Damage and Change Assessment

1. In Phase 2 BDA, assess the effect of military force to degrade or destroy the capability of the target to function. Include the level of success in achieving operational objectives established against the target. Base this assessment on all-source information and include an estimation of the time required for recuperation or replacement of the target function.

2. As in Phase 1 BDA, the change assessment measures change to the target resulting from fires that do not create physical damage. Change relates to a condition, behavior, or degree of freedom resulting from an action or set of actions. The capabilities that drive change assessments may not result in immediate or easily recognizable effects. Include the level of confidence for the physical and change assessments in the BDA.

(c) BDA Phase 3, TSDA. The TSDA encompasses all-source assessments of the change and remaining target system functional capabilities and capacities relative to the targeting objectives after military operations begin. TSDA products, as well as tools modeling the target system functionality, provide a baseline for evaluating the overall results of targeting operations on adversary target systems. Base this evaluation on the aggregate of FDAs of individual targets within the system, and on changes resulting from second- and third-order effects.

(d) BDA analysts must closely coordinate with intelligence collection managers and target developers to manage collection requirements. With limited collection assets, the joint force must diligently manage, and as necessary, remove BDA collection requirements upon completion of BDA assessments.

(4) Collateral Damage Assessment. A component of CA, CDA evaluates damage usually located outside of the target boundary. Conduct CDA if the nearest collateral concern lies within the target boundary and received damage from the engagement. BDA analysts will report identified collateral damage in accordance with command established processes and procedures. This reporting may occur during any phase of the JTC. Pre-strike CDE informs CDA. In CDA, analysts determine and document the actual collateral damage resulting from targeting operations. CDA is primarily the responsibility of the J2 with required inputs and coordination from the J3 and JFE. Enclosure D details CDA.

(5) Munitions Effectiveness Assessment. A component of CA, MEA evaluates fires applied in terms of the weapon system and munitions effectiveness to determine and recommend any required changes to the methodology, tactics, weapons system, munitions, fuzing, and weapon delivery

parameters to increase force effectiveness. MEA compares the anticipated effectiveness calculated in the weaponeering solution to the actual effectiveness of the means employed. MEA is primarily the responsibility of the J3 and JFE. Enclosure E details MEA.

(6) Re-attack Recommendation. The three components of CA may result in the need to recommend a re-attack against a target. The RR process considers the threat's remaining capability, capacity, and intent, as well as the potential for recuperation. This process concludes the CA and attempts to solve deficiencies identified during the BDA and MEA processes. RR is a shared J2, J3, and JFE responsibility. Enclosure F details RR.

Inputs to CA	CA	CA Outputs
JTC Phase 1 - End state and objectives - Measures of effectiveness (MOEs) and measures of performance (MOPs) JTC Phase 2 - Target System Analysis - Target characteristics JTC Phase 3 - Aim points and weaponeering - Collateral Damage Estimation (CDE) - Desired effects and collection requirements JTC Phase 4 - Weapons and assets - Delivery TTP JTC Phase 5 - Mission details - Mission reports	Battle Damage Assessment (BDA) (*Intelligence function*) Collateral Damage Assessment (CDA) (*Operations function*) Munitions Effectiveness Assessment (MEA) (*Operations function*) Re-attack Recommendation (*Intelligence recommendation/ Operations concurrence/ Command decision*)	BDA Products: - Phase 1 BDA: Physical Damage/Change Assessment - Phase 2 BDA: Functional Damage/Change Assessment - Phase 3 BDA: Target System Damage Assessment Outputs: - Supports reengagement or future targeting - Supports processes to refine military guidance, objectives, and tasks - Supports processes to refine weaponeering and CDE - Supports processes to refine force assignment - Updates intelligence collection requirements

Table 1. Relationship between the JTC and CA

(5) CA for Cyberspace Operations. Due to the wide variety of complex operations in the cyberspace domain, planners and CA analysts should reference the Cyberspace Assessment Determination Matrix (see Table 2) to determine when to complete BDA or other forms of assessment, or when assessments do not apply to the operation. When necessary to assess cyberspace operations causing a temporary effect, use the Cyberspace Temporary Effects Assessment Report (CTEAR) (see reference j).

Mission	Effect	Assessment	Report Type
Offensive cyber operations with cyber-attack effects to:	Degrade, Disrupt, Manipulate (Temporary)	Optional	CTEAR
	Destroy, Damage, Manipulate (Permanent)	Required	BDA
Defensive cyber operations-response action with cyber-attack effects to:	Degrade, Disrupt, Manipulate (Temporary)	Optional	CTEAR
	Destroy, Damage, Manipulate (Permanent)	Required	BDA
Information Operations	No Denial	N/A	N/A

Table 2. Cyberspace Assessment Determination Matrix

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ENCLOSURE C

BATTLE DAMAGE ASSESSMENT METHODOLOGY

1. Introduction. BDA provides the timely and accurate estimate of damage resulting from the application of lethal and nonlethal military force. The BDA methodology provides methods and principles to conduct BDA. BDA determines effects at the target element, target, and target system levels. BDA, along with CDA and MEA, supports RR and can assist in determining possible follow-on targets. The BDA methodology provides the framework to answer these questions:

a. Did the weapon or capability affect the target?

b. What was the extent of the effect at the target element, target, and target system level?

c. Was there additional or collateral damage that should be reported?

d. Were the commander's targeting objectives met?

e. What are the intelligence inputs for MEA?

f. What are the intelligence inputs for RR or future targeting recommendations?

2. Battle Damage Assessment Methodology. The BDA process uses joint doctrinal terminology and the target taxonomy to assess the effects of target engagements on adversary target elements, targets, and target systems. The BDA process begins with an assessment at the target element level and concludes with assessment at the target system level. This methodology involves a systematic, analytical process and phased BDA production.

3. Battle Damage Assessment Framework

a. Step 1: Perform preparation and planning.

(1) Understand the JFC's objectives.

(2) Gather data and study the assigned target with emphasis on the ETF and targeted critical elements.

(3) Review the target's operational status and previous BDA products.

(4) Understand the planned pre-strike and post-strike collection activities.

(5) Understand the targeting objectives and tasks.

b. Step 2: Conduct a physical damage/change assessment on targeted elements. Identify any unusual munitions effects, additional damage, or collateral damage.

c. Step 3: Conduct a functional damage/change assessment on targeted elements. Estimate recuperation time based on the damage to targeted elements.

d. Step 4: Conduct a TSDA based on collective functional damage to the targets in the system. DIA, or the appropriate organization with RESPROD, accomplishes Phase 3 BDA.

e. Step 5: Based on target system damage, assess progress toward targeting objectives and consider if a RR should be conducted.

4. Battle Damage Assessment Systematic Analytical Process. Accurate and timely BDA requires input from operational and intelligence data produced in Phases 1 through 5 of the JTC. These inputs include the ETF (with all graphics and intelligence as per reference b), relevant MISREPs, and the commander's objectives, targeting guidance, and intent. BDA federated among CCMDs, CSAs, and coalition partners requires strict attention to classification and releasability. Source products related to BDA and finished CA products disseminated across multiple networks and improperly classified materials will cause significant delays to providing support to ongoing operations. The following describes the physical damage/change assessment, functional damage/change assessment, and Target System Functional Assessment that comprise BDA.

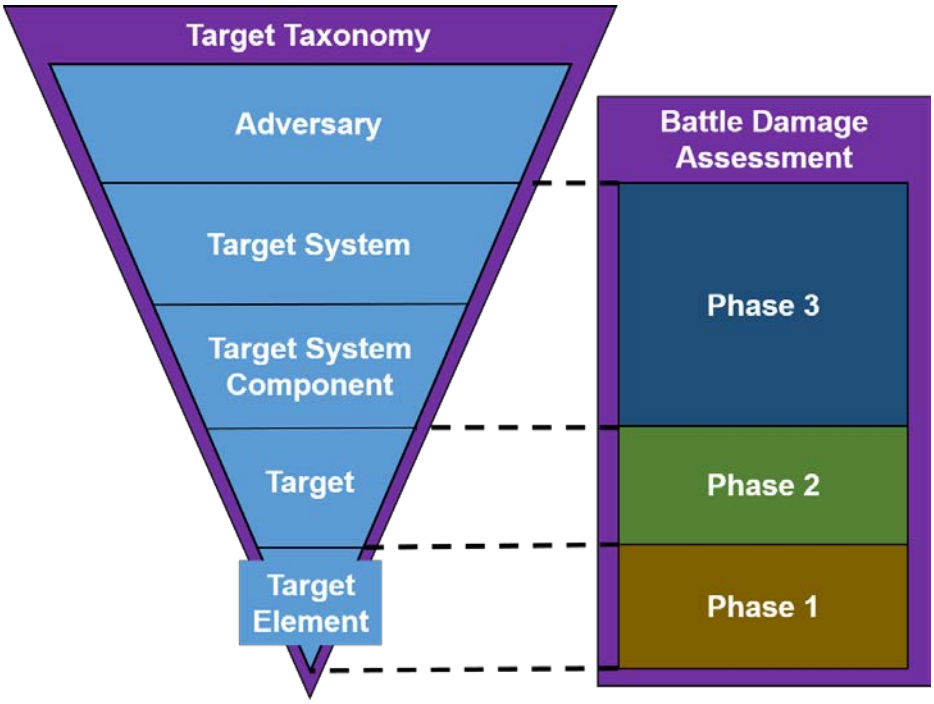


Figure 3. The Target Taxonomy and BDA

a. Phase 1 BDA: Physical Damage/Change Assessment. Fires interact with the target at the targeted element. A targeted element is an element of an entity selected for possible engagement to support the achievement of an operational objective or mission task. A physical damage quantitates physical damage to a target element resulting from the application of lethal and nonlethal military force. A change assessment measures change to the target element resulting from lethal and nonlethal military force.

(1) Physical Damage Assessment. Assess physical damage at the element level to support subsequent FDA to the target and target system. To determine physical damage, the BDA analyst should examine each impact point to assess whether the weapon hit or missed. Independently assess damage to the target element as a whole. Quantifying physical damage requires the analyst to consider whether the enemy used denial and deception techniques to minimize or amplify the extent of physical damage, which may distort the assessment.

(a) Physical Damage Framework. Express PDAs as a combination of the assessed damage level and the confidence level of the assessment.

(b) Damage Levels. The basic damage categories are NO DAMAGE, DAMAGED, DESTROYED, and UNKNOWN. Some target type and engagement type combinations have specific or intermediate categories for defining physical damage. For example, in buildings, determine LIGHT, MODERATE, and SEVERE DAMAGE by the percent of the target area (building) damaged. In

contrast, when assessing armored vehicles, use the DAMAGED category. See Enclosure H for physical damage category definitions associated with target types.

(2) Physical Damage Confidence Levels. To establish a confidence level for the accuracy of a PDA, use a qualifier. The three terms used as qualifiers to identify physical damage confidence are CONFIRMED (≥95 percent confidence), PROBABLE (94 to 50 percent confidence), and POSSIBLE (<50 percent confidence). The JFC may provide additional guidance regarding confidence levels. It is highly recommended that all groups providing PDAs utilize the approved and standard definitions for confidence level qualifiers.

(3) Physical Damage Considerations

(a) Direct Versus Indirect Effects. Most weapons effects apply directly to the target. Direct effects are immediate, first-order consequences of a military action, unaltered by intervening events or mechanisms. They are usually immediate and easily recognizable. For example, artillery destroys an enemy command and control (C2) center. Weapons effects can also indirectly affect a target. Indirect effects are delayed and/or displaced second-, third-, and higher-order consequences of action, created through intermediate events or mechanisms. Cyberspace operations can create both direct and indirect effects, although the initial observable or collectable may not be immediately recognized. These outcomes may be physical or behavioral in nature. Indirect effects may be difficult to recognize due to subtle and/or long lead-time changes in system behavior. Weapons effects can be cumulative, cascading, or have unintended effects.

1. Cumulative Effects. The ultimate result of a number of direct and/or indirect effects often combine to produce greater outcomes than the sum of their individual impacts.

2. Cascading Effects. Effects on a target can damage a targeted system, often influencing other systems. Typically, this occurs through nodes and links common and critical to related systems. The cascading of direct and indirect effects, as the name implies, usually flows from higher to lower levels.

3. Unintended Effects. Effects that spill over to create unintended consequences may be counterproductive or create new opportunities. Unintended effects include unanticipated consequences, actions, or behaviors created on or within objects, entities, or systems not directly targeted.

(b) Weapon Fuzing Implications on Weapon Effects. The type of weapon fuzing employed is critical for determining the full extent of physical damage to a target. Fuzing options include airburst (variable timed or proximity), impact (instantaneous), or delayed. The fuzing option employed

determines the location of weapon detonation (relative to the aim point) and the nature of apparent/observable weapon effects.

1. Airburst Fuzed Weapons. Generally, damage is not observable since the only weapon signature from an airburst weapon is a damaged/ destroyed target and/or ground scorch marks. In certain situations, the weapon may detonate in close proximity to the target and achieve the desired level of damage with no apparent physical change to the target. Consider a POSSIBLE DAMAGE assessment when this situation occurs due to mission reporting of observed detonation, but with no confirmation on imagery or aircraft cockpit video.

2. Impact (Instantaneous) Fuzed Weapons. When employed, observed results are clear indications of weapon effects to the target and/or cratering.

3. Delayed Fuzed Weapons. When assessing delayed fuzed weapon effects against hard or soft structures, the fuze time setting, impact velocity, and impact angle determine the weapon's position or location within the target when it detonates. Apply knowledge of the target construction (i.e., number of stories or levels, spacing of support columns, thickness and hardness of concrete, and amount of overburden).

(c) Additional Considerations while Conducting PDA. Unexpected weapons effects, additional damage, and collateral damage warrant specific mention by BDA analysts. Report when these events occur, regardless of which type of assessment. Initiate a MEA when target elements do not have expected damage (see Enclosure E).

(d) Additional and Collateral Damage. The BDA process reports on all damage resulting from target engagement. Therefore, in addition to reporting damage on elements planned for attack, assess damage from weapon effects or propagation of blast, fire, or fragmentation beyond the intended target area. Define these unintentional or incidental results as additional damage or collateral damage.

1. Additional Damage. Additional damage includes unintentional or incidental injury or damage to persons or objects that are lawful military targets in the circumstances ruling at the time. Assess and report additional damage under both the targeted aim point and the damaged target element or adjacent damaged target. Do not consider this collateral damage if the damaged target element/adjacent target is a legally valid target unless the target is dual-use. For example, in an attack on aim point 1 of target element 1, target element 3 received damage from the engagement on aim point 1. Report both aim points reported with a confidence and damage assessment, and target element 3 as additional damage. When additional damage occurs,

explain in the narrative of a BDA report which target element(s) or adjacent target(s) sustained the additional damage.

2. Collateral Damage. Collateral damage involves unintentional or incidental injury or damage to persons or objects that are not lawful military targets in the circumstances ruling at the time. Such damage is lawful so long as it is not excessive when compared to the overall military advantage anticipated from the attack. When analysts suspect collateral damage, immediately notify leadership and initiate a CDA, per Enclosure D.

(4) Change Assessment. A change assessment measures change to the target element resulting from the employment of lethal and nonlethal military force that does not create physical damage. It is the nonphysical damage equivalent of PDA.

(a) Change Assessment Framework. Express change assessments as a combination of the assessed damage level and the confidence level of the assessment.

(b) Change Levels. The basic change categories are consistent with physical damage definitions: NO CHANGE, CHANGED, DESTROYED, and UNKNOWN. However, some target type and engagement type combinations have specific or intermediate categories of damage definitions. For example, with electronic data, determine MANIPULATED, DEGRADED, and DISRUPTED by how the data is affected or by a percent of system capacity reduction. See Enclosure H for physical damage/change category definitions associated with target types.

(c) Change Assessment Confidence Levels. A change assessment is an estimate that depends on the type and level of available data. Use a qualifier to reflect that analyst's confidence level. The three terms used to identify change assessment confidence are CONFIRMED (≥95 percent confidence), PROBABLE (50 to 94 percent confidence), and POSSIBLE (<50 percent confidence). The JFC may provide additional guidance regarding confidence levels. The wide dissemination of BDA products requires a consistent understanding of the confidence levels across the joint targeting community.

(d) Change Assessment Considerations. Most measurable changes may exist outside of the target. To address this, establish observables to collect information where expected measurable changes may occur. These observables can be equipment, facilities, or systems that will indicate measurable changes. Measurable changes can vary from minimal increased/ decreased activity to the destruction of observables. Establishing an observable or collectable toward the targeted entity aids in measuring changes through tasking the appropriate collection asset and identifying associated

indicators. However, incomplete target development or the employment of incorrect intelligence assets may lead to overlooking a critical indicator.

(e) Additional Issues to Assess while Conducting Change Assessment. If the damage definitions in Enclosure H do not address the specific type of target element engaged, then BDA analysts should use their best judgment to characterize the nature of the change.

(f) Space Effects. A change assessment of space effects rely on U.S. Strategic Command, Joint Forces Space Component, Space Operational Assessment Reports to satisfy initial assessment and can support Phase 1 and 2 BDA reporting.

(5) Estimated Damage Assessment. As an analytical tool, EDA supports a PDA by anticipating damage using the probability of weapon success.

(a) EDA Framework

1. Perform EDA when BDA-related intelligence is not available but an assessment is required. EDA uses MISREPs, weaponeering predictions, and the results from similar attacks to assess the attack. Base the EDA on the accuracy and reliability of the weapon and its known effects on the target type. Due to EDA's requirements for empirical data, limit its use to weapons contained in the JMEM with probabilities of damage or kill and circular error probabilities based on historical test and operational data. However, analysts may supplement JMEM data with current Service-validated operational data to refine the empirical data used to generate the estimate.

2. Although not applicable in all situations, consider EDA for attacks using high-reliability weapons with high probabilities of damage against known targets. EDA may be pertinent to certain target sets based on the commander's risk acceptance. For example, a commander may accept risk by approving EDA for infrastructure targets but not permit EDA for weapons of mass destruction-related targets. EDA allows analysts to assess targets upon confirmation that the attack occurred (possibly via MISREP or in-flight report). Depending on the target size, the number of weapons, and associated probability, a quick assessment can be made of the target.

(b) Estimated Damage Levels. The basic damage categories are similar to those for PDAs: NO DAMAGE, DAMAGED, DESTROYED, and UNKNOWN. Analysts could expand on these basic damage categories using the physical damage definitions in Enclosure H and planned weaponeering-desired damage.

(c) Confidence Levels. Analysts who use EDA should list the confidence level as POSSIBLE and note its use in the BDA product. For

example, a target element attacked by a weapon with a probability of damage of 75 percent would have physical damage assessed as POSSIBLE SEVERE DAMAGE, while a target element with a probability of damage of 30 percent would be assessed as POSSIBLE MODERATE DAMAGE.

(d) EDA Considerations. If a JFC chooses to use EDA, or authorize a subordinate command's use of EDA, articulate it in each of the appropriate BDA CONOPS for the operation. At a minimum, these CONOPS should specify which target(s) and weapon type combinations approved for EDA. Based on the CCMD and component commanders' BDA CONOPS, these assessments can be refined with additional intelligence collection as the operation continues. If considered sufficient by the JFC, EDSs can serve as final assessments.

b. Phase 2 BDA

(1) Functional Damage Assessment. FDA estimates the effect of target engagements on the functional or operational capability of the target to perform its intended mission. FDA estimates the remaining functional or operational capability of the target. Analysts may, and often do, conduct FDA concurrently with Phase 1 BDA.

(2) FDA Framework. FDAs consist of three parts: functional damage level, recuperation time, and task assessment.

(a) Functional Damage Levels. To determine the functional damage level of a target, assess the cumulative physical damage/change and functional damage at the target element level. Next, assess the functional damage level that describes the damage to the target. FDA uses the following basic damage levels: NO FUNCTIONAL DAMAGE, LIGHT FUNCTIONAL DAMAGE, MODERATE FUNCTIONAL DAMAGE, SEVERE FUNCTIONAL DAMAGE, FUNCTIONALLY DESTROYED, ABANDONED, and UNKNOWN FUNCTIONAL DAMAGE. Some target and engagement combinations have specific or intermediate categories of functional damage definitions. Use functional damage definitions in target element, target, and target system functional assessments. However, base the overall functional damage BDA on the functional damage to the target. See Enclosure H for definitions of functional damage categories.

(b) Recuperation Times. A recuperation assessment estimates the minimum and maximum amount of time (expressed in hours, days, or months) required to restore or replace the targeted function. The minimum and maximum recuperation values bound the threat of recuperation between the fastest possible (minimum) and realistic (maximum). Based on the targeting objectives and available information, analysts may need to include a partial recuperation estimate in the BDA. For example, it could be estimated that an enemy needs 30 days to recuperate a particular target's functionality, but

could reconstitute 50 percent capacity in only 3 days. Depending on the function, this could be enough for the enemy to maintain its course of action.

1. As with assessing the functional damage category, analysts will likely start at the element level when determining the recuperation time for a target. Determine the overall target recuperation time by analyzing the recuperation times of each target element and critical element within the target and then determining the minimum recuperation times for the targeted function.

2. Understanding how a target's critical elements relate to one another and their contribution to the overall functionality of the target is crucial. For example, if the critical elements perform in a series, then all the critical elements must be recuperated before restoring the function. For linear systems, the target's recuperation time will be the same as the critical element with the longest recuperation time. By contrast, if the critical elements perform in parallel, then only one of the critical elements must be recuperated before partially restoring the function. For nonlinear systems, the target's recuperation time may be the same as the critical element with the shortest recuperation time. See Figure 4 for a graphical depiction of linear and nonlinear systems.

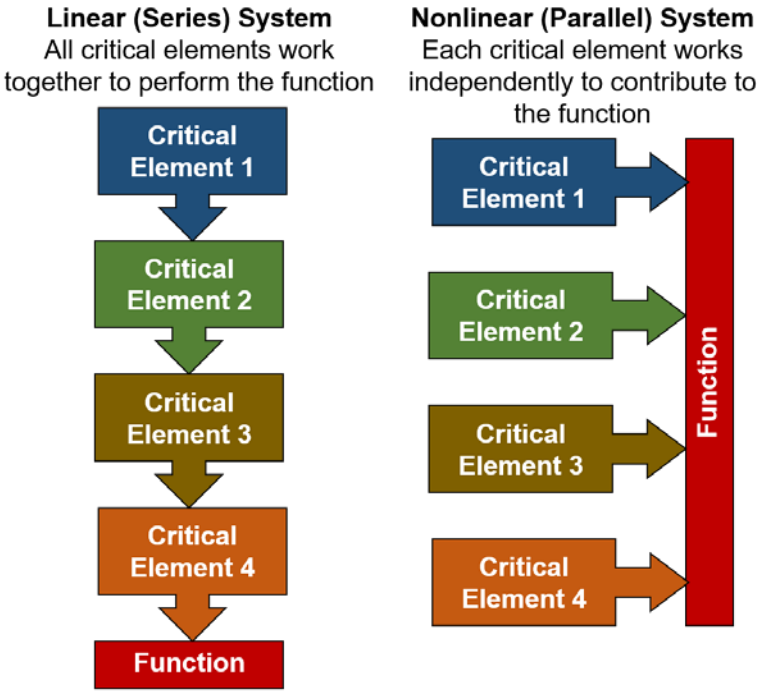


Figure 4. Linear vs. Nonlinear Critical Elements Contribute to Target Function

3. Recuperation depends on many factors. The most influential involve national and local priorities, workload, equipment, and resources. Priorities are difficult to determine, but use the remaining factors to describe

whether the recuperation effort will be short, normal, or drawn out, as shown in Table 3:

Short	Priority + light workload + available equipment + resources to meet objective
Normal	Priority + significant workload + available equipment + resources to meet objective
Drawn-out	Significant workload + lack of equipment + lack of resources to meet objective

Table 3. Generic Recuperation Time Dependencies

(c) During Phases 2 and 3 of the JTC, express a desired level of damage or effect on the target in functional terms. Perform the task assessments by comparing the assessed levels of functional damage to the desired levels of damage or effect to determine accomplishment of the targeting task. MOPs produced during operational planning often serve as the metric used to assess the task. The categories for task assessment are ACHIEVED, NOT ACHIEVED, and UNKNOWN.

1. ACHIEVED. The assessed functional damage level and recuperation times meet or exceed the desired damage or effect and times. Include supporting analytical evidence and arguments in the BDA narrative.

2. NOT ACHIEVED. The assessed functional damage level and recuperation time do not meet the desired damage or effect and times. Include in the BDA narrative, if an attack on a target results in some functional damage that contributes toward task achievement.

3. UNKNOWN. The analyst lacks required information to determine accomplishment of the task. Justify a task assessment of UNKNOWN in the BDA narrative. For example, this may occur if the analysts does not know the desired damage level or effect, or if the MOP requires an assessment of more than one target.

(3) FDA Considerations

(a) Express FDAs for a target as a combination of the damage category, the recuperation time, and a task assessment. For example, an FDA for an airfield could be SEVERE FUNCTIONAL DAMAGE, MINIMUM RECUPERATION 1 HOUR/MAXIMUM RECUPERATION 24 HOURS, TASK NOT ACHIEVED. Detail the justification for this assessment in the narrative of the assessment.

(b) Refer to either the DIA Critical Elements Handbook or the Critical Elements Guide to determine critical elements, their functional relationship for facility type targets, and estimated recuperation time (see references d and e). The handbook and guide support target development, but they are useful for BDA on facility targets as well. These documents only include critical elements for facility targets. Use the handbook or guide as a supplement to and not a

replacement for the target materials developed during Phase 2 of the JTC, Target Development and Prioritization. The guide does not categorize elements by country, something that analysts should factor into their assessment based on the adversary's capability to reconstitute.

(c) The relationship between critical elements and confidence in the physical damage/change assessment of target elements attacked determine how difficult it will be to assess functional damage. High confidence in the physical damage/change to critical elements provides a distinct correlation with the damage/change achieved. For example, consider an attack conducted with the objective to shut down a building's power for 24 hours. The building's only source of power is a generator that is located just outside the facility and fully exposed. Conventional air-to-surface munition targeted the generator, and, based on imagery of a crater, use a CONFIRMED DESTROYED PDA for the generator. Make a FDA based on the two variables mentioned above, as depicted in Table 4:

Critical element(s) relationship to an attacked target element(s)	PDA of target element(s) attacked	Functional damage category for each critical element	Functional damage category for the target
1) Generator: The only power source for the building is the generator. If this generator is not operational, the building will not have power. This critical element is the attacked target element.	1) Generator: CONFIRMED DESTROYED.	1) Generator: FUNCTIONALLY DESTROYED. The generator target element has a PDA of CONFIRMED DESTROYED; therefore, assess the functional damage category for the same generator as FUNCTIONALLY DESTROYED.	FUNCTIONALLY DESTROYED: Based on the objective of the attack and the engagement type, the only critical element is the generator itself. It is the only source of power for the building. The generator is inoperable, so power must shut down for at least 24 hours.

Table 4. Example of Functional Damage Category Assignment

(d) If analysts knew the building in the previous example had two backup generators, but their location is unknown, then consider representing the process of assigning a functional damage category as in Table 5:

Critical element(s) relationship to an attacked target element(s)	PDA of target element(s) attacked	Functional damage category for each critical element	Functional damage category for the target
1) Generator: The primary power source for the facility is the generator. If this generator is not operational, the facility would rely on its two backup generators for power. This critical element is the target element that was attacked.	1) Generator: CONFIRMED DESTROYED.	1) Generator: FUNCTIONALLY DESTROYED. The generator target element has a PDA of CONFIRMED DESTROYED; therefore, the functional damage category for the same generator is assessed as FUNCTIONALLY DESTROYED.	LIGHT FUNCTIONAL DAMAGE: The primary power source is functionally destroyed; however, both backup generators are assumed operational. It is likely the facility will have power over the next 24 hours.
2) Backup Generator #1: Location is unknown and was not attacked.	2) N/A. No target element associated with Backup Generator #1 was attacked.	2) Backup Generator #1: NO FUNCTIONAL DAMAGE. It is assumed the backup generator is operational.	
3) Backup Generator #2: Location is unknown and was not attacked.	3) N/A. No target element associated with Backup Generator #2 was attacked.	3) Backup Generator #2: NO FUNCTIONAL DAMAGE. It is assumed the backup generator is operational.	

Table 5. Example of Functional Damage Category Assessment

(e) Determining a functional damage category is more difficult when the relationship between the physically damaged/changed target elements and the critical elements is not obvious. In these cases, apply analytical judgement to derive the functional damage category.

(f) Four important factors to consider when assessing critical element damage from the target element damage include location, scale, strength, and duration. Assess these factors against the relationships of the target element, critical elements, and weapon effects to determine the functional damage. Table 6 shows examples of questions to ask when considering these relationships.

Location	1) Where are the critical elements within the target element? 2) How well are the critical element locations known? 3) How deep are the critical elements inside of the target element? 4) Are the critical elements protected internally? 5) Can the weapon effects reach the critical elements?
Scale	1) What were the observed weapon effects? 2) What is the size of the target element compared to the weapon effects? 3) What level of physical damage/change is observed to the target element? 4) What are the sizes of the critical elements compared to the target element? 5) What level of physical damage/change is observed to the critical element?
Strength	1) How sturdy are the critical elements compared to the target element? 2) Will the critical elements break before or after the target element? 3) How powerful are the weapon effects?
Duration	1) How long do the weapon effects last? 2) How quickly can the critical element be repaired? 3) How quickly can the target element be repaired?

Table 6. Factors to Consider When Assessing Critical Element Damage

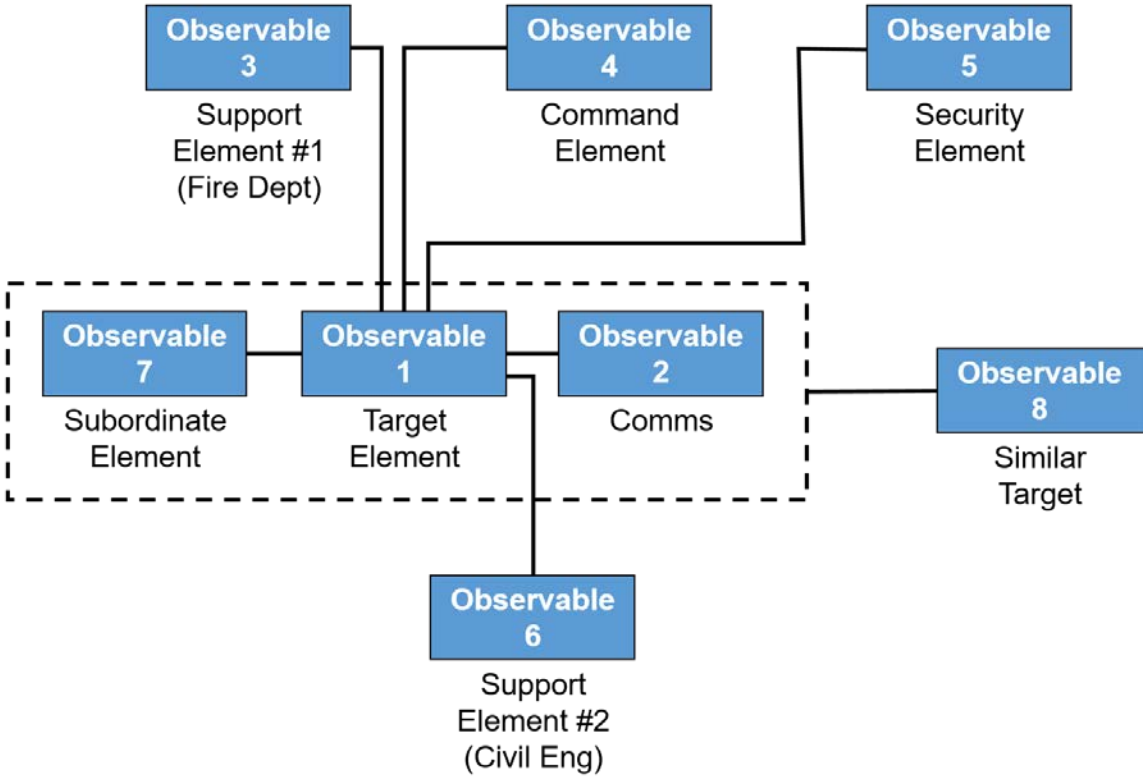
(g) Inference and Functional Damage/Change. Functional damage/ change is not always observable directly. Even though a target may have sustained physical damage, it may remain operational. In the case of a tank, functional damage may be apparent (for example, if a tank has lost its main armament). However, unless a tank's treads are clearly visible, it may be difficult to determine if the tank is able to move. Similarly, a factory building with a hole in its roof may still be able to operate at capacity if critical machinery or equipment inside remains functional. Effective BDA requires the analyst to gather the needed intelligence and may require requests for information and additional intelligence collection and production during pre- and post-strike analysis. Analysts apply available intelligence to understand their targets function, component organization, and interrelationships of the critical target elements to enhance the estimate of functional damage reported.

(h) Battle Damage Indicators (BDIs). A BDI is as a measurable phenomenon used to indicate damage/change to a target. Use BDIs in BDA production. For example, potential BDIs for an attack on a power station could include inoperable electrical lights or an increase in the use of backup power generators.

1. Assessing the damage to a target can be complicated when BDIs reside at multiple locations, occur incrementally, or have a transient (nonpermanent) nature. BDIs will have associated observables to determine if changes occurred (Figure 5).

2. Collection requirement managers should pre-determine what type of intelligence collection could gain enough information from observables to make a FDA on the target. For example, one observable for an attack against a power station could be a critical headquarters (HQ) facility that relies

on the power station for electricity. Multiple intelligence sources could determine the status of electricity at this facility, including the use of backup generators. Another observable could be local news outlets, which would likely report on power outages. Consider leveraging open-source intelligence in this case to provide BDIs. The targeted power plant itself could be an observable to gain information about repair and maintenance activities at the facility.



For this example, an Information Operations attack took place against the target element assigned as Observable 1.

Figure 5. Observable Example

c. Phase 3: TSDA

(1) TSDA Purpose. The TSDA determines the functional damage of the entire target system (e.g., air defense forces or power). The target system, target, and target element relationship appear in Figure 6 (see reference b for target system descriptions). The TSDA contributes to assessing the accomplishment of commanders' objectives, especially with objective tied to desired effects across an entire target system. For example, a commander's objective might be to degrade an adversary integrated air defense system.

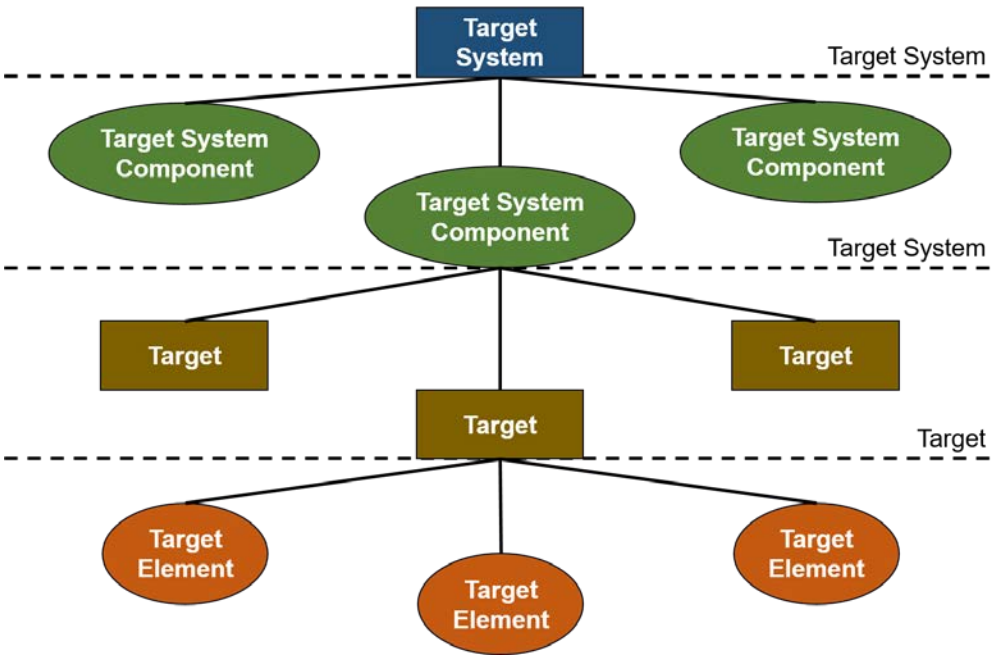


Figure 6. Targeting Taxonomy

(2) TSDA Framework. Base the assessment on the cumulative level of functional damage to the targets that make up the system.

(3) Functional Damage Levels. BDA analysts use the same damage definitions used in determining target functional damage.

5. Battle Damage Assessment Production

a. Intelligence personnel normally produce BDA through a phased process, starting with aim point-level evaluations of primary damage mechanisms and effects on targeted elements. Collect, document, aggregate, and assess micro-level assessments to eventually build the necessary intelligence and rationale for both entity-level and macro target system-level assessments. Update these assessments at any time with new information, consistent with all intelligence production. An established technique for BDA production is to produce an initial Phase 1 and Phase 2 assessment and a supplemental Phase 1 and Phase 2 report when new intelligence or operational information requires modification of the initial assessment. As required, call out CDA, MEA and RR on the same BDA product.

b. The initial FDA and RR may have a lower reliability due to the limited intelligence available. Any RR provided in BDA products should flow back into the target nomination and approval process.

c. Typically, base Phase 1 BDA on single-source reporting. CCMDs may apply restrictive timeline requirements as directed through the JPP. For mobile

ground targets located short of the fire support coordination line, Phase 1 BDA relies heavily on operational reports from units in contact and information from organic intelligence collection assets.

d. The CCMD J2 determines the primary means for documenting and disseminating Phase 1 and 2 BDA products and communicates via the ETF or other means, as required in Appendix 4 (Targeting) to Annex B (Intelligence) of the plan or operation. In addition to any CCMD-specified tools, update a target's physical and functional status in MIDB. Use the U.S. Message Traffic Format (USMTF) for all BDA-related formal message traffic to facilitate automated databasing.

e. Phase 2 BDA products, because of their all-source nature, could require longer periods to conduct. Phase 2 BDA provides assessment at the target level. CCMDs may apply restrictive timeline requirements as directed through the JPP. Disseminate Phase 2 BDA products in the same manner as Phase 1 reports as described above. Phase 1 and 2 BDA can be produced concurrently in one BDA product.

6. Battle Damage Assessment Databasing Standards. **Database BDA in the BDA remark of the ETF for a target in MIDB**. Provide the minimum details necessary to create a TSDA.

a. Phase 1 BDA: Physical Damage

(1) Physical Damage: Reference Appendix to Enclosure H for physical damage criteria for the target type.

(2) Physical Damage Confidence: Select appropriate confidence call.

(3) Percent Damage (optional).

(4) Percent Destroyed (optional).

b. Phase 2 BDA: Functional Damage

(1) Functional Damage: Reference Appendix to Enclosure H for PDA definitions for the target type.

(2) Operational Status: OPERATIONAL, LIMITED, NON-OPERATIONAL

(3) Recuperation Time Minimum (optional).

(4) Recuperation Time Maximum (optional).

(5) Time Unit of Measure (optional): Indicate minutes, hours, days.

c. Phase 3 BDA. TSDA products describe the FDA at the target system level. Base this report on all-source reporting and a detailed review of available, system-relevant Phase 1 and Phase 2 BDAs.

(1) As an all-source analytical effort, national-level intelligence agencies normally complete Phase 3 BDA. To assess the impact on a target system, TSDA uses Phase 1 and Phase 2 BDA reports from multiple targets, as well as all-source intelligence. Complete Phase 3 BDA expeditiously to ensure assessments can inform operational and campaign planning. Operations and intelligence collection determine the timeline for Phase 3 BDA production, as directed through the JPP.

(2) Transmit Phase 3 BDA products from the national-level producer to the JSTIC via CONOPS-specified procedures.

d. Table 7 shows the types of assessments used in the three types of BDA products.

Assessment Type	PDA/Change Assessment	FDA	CDA/Additional Damage Assessment
Phase 1 BDA **PDA/Change Assessment**(Often single-source intelligence)	Initial PDA/change assessment of aim points, and target elements due to direct and unintended weapon effects. When necessary, include a RR.	Initial FDA of target, if able.	When noted, include CDA/additional damage and MEA inputs.
Phase 2 BDA **FDA** (All-source intelligence; may be produced concurrently with Phase 1 BDA)	Detailed PDA/ change assessment of aim points and target elements due to cumulative weapon effects.	Detailed FDA of target. When necessary, include a RR.	When noted, include CDA/additional damage and MEA inputs.
Phase 3 BDA **TSDA** (All-source intelligence)	Not performed.	In-depth target system FDA and outlook. When appropriate, include a RR and target nomination.	Not performed.

Table 7. Types of BDA Products and Associated Assessments

e. The JFC usually directs the BDA reporting process, but the nature of BDA federation and the responsibilities of Service intelligence centers and CSAs dictate the need for a joint standard. Commands should publish BDA CONOPS in Appendix 4 (Targeting) to Annex B (Intelligence) of the plan or operation. BDA CONOPS must provide theater-specific BDA procedures for particular operations and expand on the minimum joint standards, but the

CONOPS should be consistent with this instruction. At a minimum, use reporting timelines, report formats, databasing procedures, and reporting dissemination procedures articulated in this document, unless operational needs dictate theater-specific requirements.

(1) Reporting timelines should clarify how soon to report after an attack or after receipt of post-attack intelligence.

(2) Provide the content requirements of joint standard report formats.

(3) Include recuperation assumptions.

(4) Consider BDA information technology architecture and TTP (e.g., domains, applications/tools, post-strike data dissemination processes, and MIDB access and authorities, etc.). To the maximum extent possible, store BDA within MIDB and disseminate via all channels directed by the JFC's BDA CONOPS in order to facilitate future target development, ensure continuity in targeting documentation, and ensure the widest dissemination.

(5) If approved by the JFC, EDA processes should include authorized target(s) and weapon type combinations.

APPENDIX A TO ENCLOSURE C

PHASE 3 TARGET SYSTEM DAMAGE ASSESSMENT
REPORT TEMPLATE

1. (U) Administrative Data

(U) Report intelligence cut-off date (ICOD): ddhhmmZ MMM YY

(U) Report point of contact: DIA Phase 3 BDA Cell, DSN 428-4449/2263, VOIP 982-4106/1860, (email address TBD)

(U) Source for Damage Definitions: CJCSI 3162.02, Methodology for Combat Assessment (JWICS link, SIPRNET link)

(U) Purpose: This Phase 3 BDA report is the assessment of [CJCSI 3370.01 series target system name] target system functionality and residual capability. It is provided to [command title] for consideration in assessing functional damage against operational objectives. [Command title] is the final authority for Change Assessment reporting in their area of responsibility. This functional assessment reflects reporting on all targets damaged in this system to date.

2. (U) Confidence Level

(X//XXX) [text]

3. (U) Executive Overview

(X//XXX) [Target system]. The amount of damage to [target system] is assessed as [applicable doctrinal functional damage term].

4. (U) Implied Objectives

(U) Note—[Office of primary responsibility] developed these objectives, derived from [source(s)], and an assessment of current target development efforts.

1. [Applicable implied objective]

1.1 [As applicable, any sub-objective(s)]

5. (U) Operational Objectives

(U) Note—[Office of primary responsibility] developed these objectives, derived from [source(s)], and an assessment of current target development efforts.

1. [Applicable operational objective]

1.1 [As applicable, any sub-objective(s)]

6. (U) Assessment

a. (U) Target Function Damage Updates

BE	Target Name	Category Code	Functional Damage	Status[1]	Objectives[2]
1234-56789	[Facility Name]	XYZ	(Ph 2 Damage)	New	[Para 4/5]
1234-56789	[Facility Name]	XYZ	(Ph 2 Damage)	New	[Para 4/5]
1234-56789	[Facility Name]	XYZ	(Ph 2 Damage)	New	[Para 4/5]

[1] "New" indicates this as the first time this target has been included in a Phase 3 report. "Yes" indicates that the FDA changed from the previous Phase 3 report. "No" indicates that FDA did not change from the previous Phase 3 report.

[2] These include the implied and operation objectives used to determine the target system FDA.

Table 8. Target Function Damage Updates

b. (U) Functional Assessment Summary

(X//XXX) The target set contained [X] targets of which [X] were struck. [This will be the placeholder for the analytic narrative for this report.]

c. (U) Recuperation Time

(X//XXX) [Focus on an analytic assessment of what the adversary can/may do based on strikes and effects contained in this report.]

d. (U) Re-attack Recommendations

(X//XXX) [Focus on damage levels contained in this report to specific targets and RRs to achieve overall command objectives.]

e. (U) Task Assessment

(X//XXX) [Focus on whether the target system tasks, objectives, and/or MOEs have been met].

APPENDIX B TO ENCLOSURE C

BATTLE DAMAGE ASSESSMENT FEDERATION

1. Introduction. Federated BDA distributes the production workload among multiple organizations throughout the national, joint, and Service intelligence architectures to leverage sufficient production resources or expertise to meet the required operations tempo (reference k). Base federation relationships and assignments on target sets, systems, organizational expertise, and organizational capacity. Though federated partners produce BDAs, final authority resides at the supported command or authorized functional command.

2. Federated BDA Example. Figure 7 shows an example of a federated BDA organizational architecture. In this example, the supported command divides the BDA target sets among themselves and three other participants. The supporting commands and participating organizations complete PDAs and FDAs for their assigned target sets and produce Phase 1 and 2 BDA products. Federated partners pass these reports to the supported command as inputs for their BDA production of TSDAs. The supported command is responsible for BDA quality control and product dissemination.

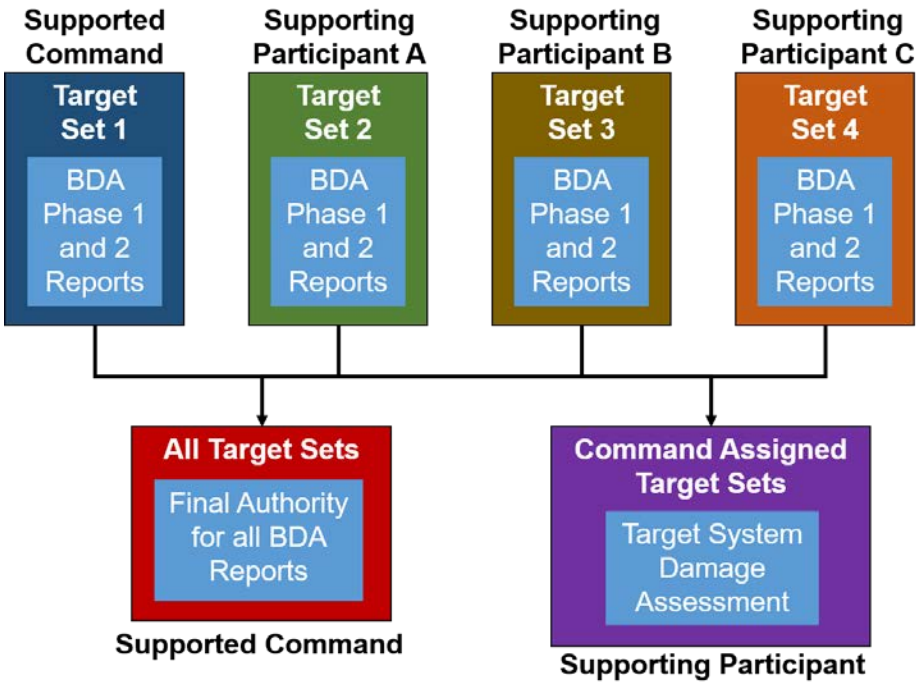


Figure 7. Federated BDA Example

3. Responsibilities

a. JS Targeting

(1) Ensure functional support plans (FSPs) include federated relationships as part of the national intelligence support plans for each OPLAN. Tailor the extent of federation to meet the requirements of each individual OPLAN.

(2) Coordinate BDA support from across the IC and operational centers/agencies, as required. Act on behalf of the CCMD to leverage prospective allied and non-IC federated partners (e.g., the Defense Threat Reduction Agency or Joint Warfare Analysis Center).

b. Supported Commands

(1) Publish detailed BDA CONOPS describing theater-specific procedures, automation, production timelines, BDA production information (i.e. targeting objectives), BDA federation plans, and foreign disclosure considerations. BDA CONOPS will include appendices with templates of any required products, to include the BDA worksheet and graphic, and Quality Control checklists for these products, if the CCMD requires deviations from this instruction.

(2) Confirm that supporting commands/organizations receive BDA CONOPS, current targeting objectives, relevant MOEs and MOPs, and access to the required databases, networks, mission information, and systems.

(3) Coordinate with JS Targeting and supporting commands/ organizations to ensure the synchronization of OPLAN FSPs with the supported command and JSTIC.

(4) When appropriate, include supporting commands/organizations in BDA exercises.

(5) Supported commands should minimize any deviations from the product standards listed in this instruction or in the CJCSI 3370.01 series (reference b). Deviations from joint product standards decrease the consistency and standardization of CA products across CCMDs, and increase error potential from federated organizations supporting multiple CCMDs.

c. Supporting Commands/Organizations

(1) Coordinate with JS Targeting and supported commands to ensure OPLAN FSPs are accurate.

(2) Coordinate with the supported command to access BDA CONOPS for the operation, and gain access to required databases, networks, mission information, and systems.

(3) When appropriate, participate in supported command BDA exercises.

(4) Provide tailored and focused BDA training to meet supported command BDA CONOP directives and federated responsibilities.

d. Federated Organizations

(1) Coordinate with JS Targeting and supported commands to ensure the alignment and accuracy of OPLAN federated support plans.

(2) Coordinate with the supported command to access BDA CONOPS for the operation, and gain access to required databases, networks, mission information, and systems

(3) When appropriate, participate in supported command BDA exercises.

(4) Provide tailored and focused BDA training to meet supported command BDA CONOPS, directives, and federated responsibilities.

(5) Align manpower resources to meet all BDA reporting requirements.

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APPENDIX C TO ENCLOSURE C

BATTLE DAMAGE ASSESSMENT GRAPHIC STANDARDS

1. Battle Damage Assessment Graphic (BDA-G) Standards. The BDA-G visually depicts the damage to a facility target resulting from joint force engagement of that target. The BDA-G will display both pre- and post- strike imagery of the target with appropriate annotations of target elements and destruction to those target elements. Present BDA graphics either as side-by-side pre- and post-strike images or as a single post-strike image with a pre-strike inset. **The JFC may establish a policy to consolidate BDA, CDA, and MEA graphics into a consolidated CA-graphic (CA-G).**

a. Annotations. All BDA-Gs will contain header and footer boxes.

(1) Header Box

(a) Layout

1. Dimensions. H: 1.08 x W: 10, Position 0 x 0.

2. Classification Box. 1.08 X 2.17 POSITION: 7.83 X 0, Box outline: 1.5PT, Class Font bold, Class font type Arial, Class font: 12pt, Declass Font: 8, Arial and bold. Command/Org Emblem Box size: 1 x 1 Position: .08 x .05,

3. Box outline. No Outline. If making adjustments in the classification boxes from a Microsoft template, when changing the box size, lock the aspect ratio and under the Text Box click, “Do Not Autofit.” Derive all dimensions from Microsoft PowerPoint.

(b) Text line 1 (Name and Country Code) must use the same facility name and country code associated with the MIDB record. A comma with one space and the associated country code will follow the name. Text font should be bold, Arial and text size 14.

(c) Text line 2 will depict the BDA graphic. Text font should be bold, Arial, and font size 14pt.

(d) Text line 3 will include the BE, O-suffix, and CATCODE, associated with the MIDB record. Font type should be bold Arial and font size 10pt.

(e) Text line 4 will identify the target facility's geo-coordinates, ICOD currency, and date of image. Separate each subject by three spaces with text font bold, Arial and font size 10pt.

(f) Text line 5 will identify the analyst responsible for annotating the graphic using appropriate analyst and quality controller identifiers. Font type should be bold, Arial and font size 10pt.

(2) Remark Box. All BDA graphics will contain a free text box, beginning with the BDA remark, and include the classification paragraph marking, date and time of engagement, engaged entity or facility name, in vicinity of city where the target was engaged, weapons employed, PDA, confidence assessment, FDA, re-strike recommendations, estimated recuperation time, and end with a paragraph classification marking (left justified and on its own line). BDA physical and functional damage can be included on the same graphic.

b. Graphics Standards

(1) If using side-by-side graphics, partition the two images uniformly, with the pre-strike graphic on to the left of the post-strike graphic.

(2) Both images will contain call-out boxes labeling the images as appropriate (PRE-STRIKE or POST-STRIKE). PRE-STRIKE or POST-STRIKE call-out boxes should have a border outline, weight 1pt. Text within call-out boxes should be in upper case and formatted as font type bold, Arial and font size 10pt. Header information for side-by-side graphics will be the same as outlined above.

(3) Both images will include a north orientation arrow.

(4) Inset the pre-strike image on top of the post-strike image at the top right-hand corner under the header box. Should an upper right-hand corner inset image obscure post-strike damage detail, move the inset to an alternate, non-obstructive location on the image. The pre-strike inset image will not contain annotations other than a north arrow, pre-strike call-out box (top centered) with target element description for each target in the facility outline (i.e. BLDG, BRIDGE, BUNKER, or ROAD). Call-out boxes will have associated leader lines, an outline weight of 1pt and text formatted as font bold, font type Arial and font size 10pt. Leader lines should appear clearly attached to call-out boxes.

(5) The post-strike image will include a north arrow, call-out box labeled POST-STRIKE (top centered) and call-out boxes identifying each target element within the facility outline (i.e. BLDG, BRIDGE, BUNKER, or ROAD), assessed physical damage call, and confidence level. As required, use call-out boxes to

provide CDA, MEA, or RR. Call-out boxes will have associated leader lines, an outline weight of 1pt and text formatted as font bold, font type Arial and font size 10pt. Leader lines should appear clearly attached to call-out boxes and pointed at the target locations within the facility outline. Leader line format shape should reflect line color white, solid line, and line style width 2pt. When using commercial imagery to produce the BDA Graphic, place a call-out box using the license (year of image used) © 2018 DIGITAL GLOBE at the bottom right portion of the post-strike image and above the BDA Remark box. Do not capture FDAs in call-out boxes, but include them in the BDA remark of the BDA-G. Call-out boxes will have associated leader lines, an outline weight of 1pt, and text formatted as font bold, type Arial, and size 10pt. Leader lines should appear clearly attached to call-out boxes.

2. Graphic Example. Only use the license call-out box when using commercial imagery for the pre- or post-strike image. Use the image's year for the license. If the image is NTM, remove these licenses from the BDA graphic.

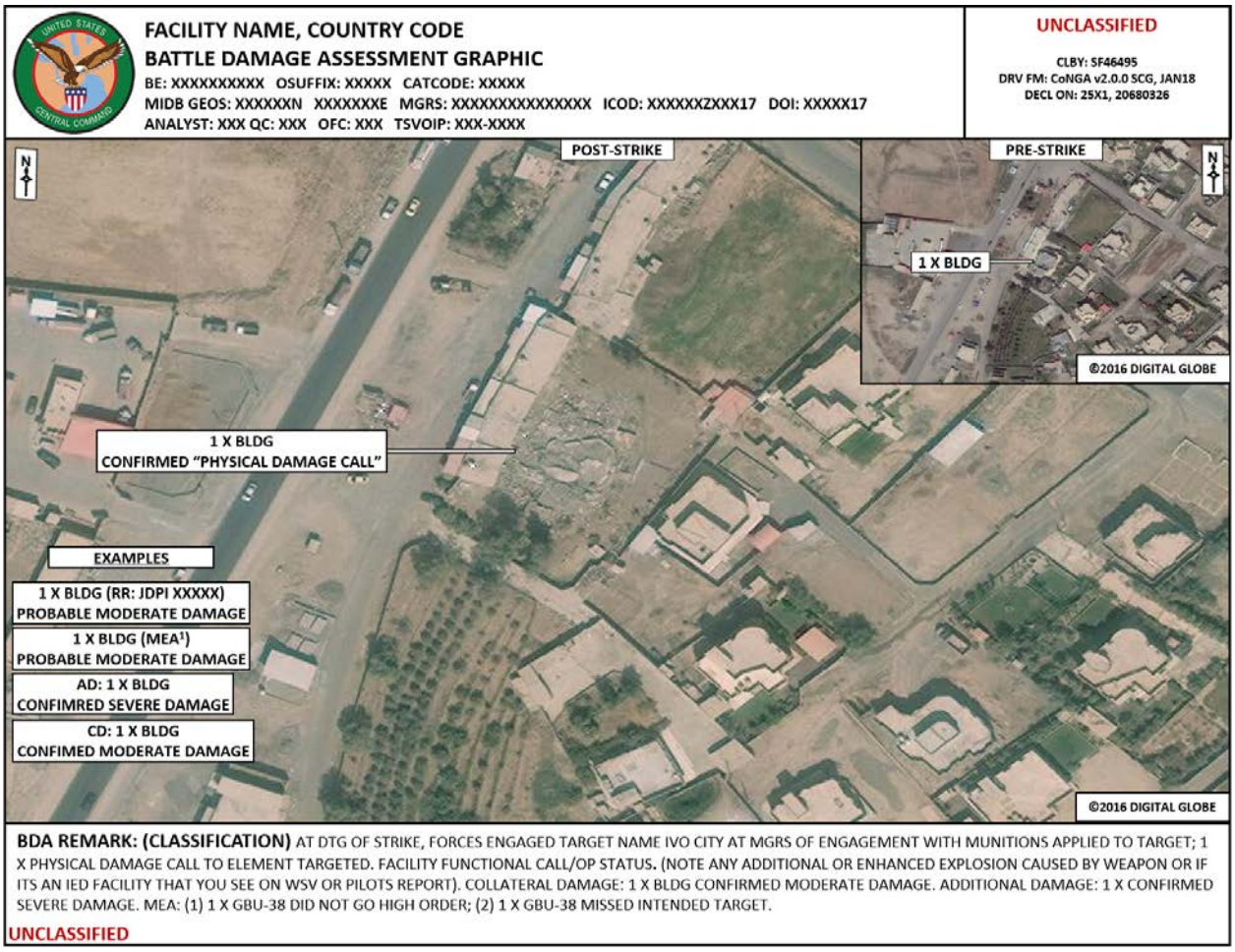

Figure 8. BDA-G Standard

3. Damage Modeling Graphic (DMG). CCMDs and DIA produce DMGs as a supplemental BDA tool to provide the JFC with estimated damage assessments to support RRs. When tasked, produce the DMG for hard and deeply buried targets when visual signatures and other intelligence data is lacking to assess damage. DIA maintains the standards for DMG production.

4. Deviation from Standard. BDA-Gs will meet the requirements outlined in this appendix, unless exceptional circumstances dictate deviation. Exceptional circumstances exist where the standard inhibits target validation or creates undue targeting risk acceptance by engagement authorities. Exceptional circumstances apply when supported and supporting commands agree to a limited period of time (i.e. dynamic targeting or a specific operation).

5. Magnification/Zoom Box. Magnification boxes coincide with a corresponding box on the image with leader lines from two diagonal corners extending to their matches on the corresponding box.

6. Imagery Standards. Subject to the operational tempo, imagery analysts should strive to produce BDA-Gs with panchromatic (visible spectrum), National Imagery Interpretability Rating Scale 4.8 or higher and 0 percent obscurity of the target or collateral hazard area. Keep the date of the image as close to the date of production as possible without going over periodicity requirements. There is no requirement for elevation angle other than the elevation angle should serve to support the functionality of the graphic. Choose imagery with elevation angles, look azimuths, and the quality to maximize interpretability by the non-imagery analyst user.

ENCLOSURE D

COLLATERAL DAMAGE ASSESSMENT METHODOLOGY

1. Introduction

a. The JFC has a responsibility to account for any unintentional or incidental injury or damage to civilians, noncombatants, or their property. Engagements that result in collateral damage negatively affect the ability of the joint force to achieve the commander's objectives. Perceived use of disproportionate force undermines support in the U.S., from coalition partners, and within the contested area. Despite the best efforts of the joint force, collateral damage will occur. In accordance with the values of our nation and the Law of Armed Conflict, it is imperative that the joint force completes CDA to identify any deficiencies requiring correction.

b. CDA compares the collateral damage estimate conducted in Phase 3 of the JTC with the observed, inferred, or reported damage. CDAs may inform and refine CDEs, if analysts anticipated collateral damage. If collateral damage occurs for other reasons, this assessment process is critical for the joint force to determine the cause, or causes, of the collateral damage.

2. Relationship between Assessments

a. Operations personnel may report collateral damage, or intelligence analysts may detect it during BDA. If detected during BDA, notify and collaborate with the J3 or JFE to aide in determining the cause of the collateral damage. Causes of collateral damage may include, but are not limited to:

(1) Lack of positive identification

(2) Munition malfunction

(3) Secondary explosions

(4) Human error

b. Collateral damage may indicate that a munition did not perform as intended. Therefore, an observation of collateral damage may require a MEA.

c. Collateral damage may impact the RR. In the event that a strike causes collateral damage and fails to achieve the intended effect, inform the target engagement authority of the outcome of the CDA.

3. Collateral Damage Assessment Methodology. Use the following steps to assess collateral damage.

a. Gather operational data to provide context in determining what the conditions were at the time of strike (i.e. the CDE, rules of engagement, or weapon selection). Due to the nature of federated targeting support, the CCMD or JTF normally possess the best resources to perform a full CDA.

b. Compare actual strike with the CDE.

c. Assess damage as collateral damage or additional damage.

d. Database CDA.

4. Collateral Damage Assessment Databasing Standards. **Database CDA in the BDA remark of the ETF for a target in MIDB.** This section provides the J2 inputs for the J3 to investigate why collateral damage occurred.

a. Collateral Damage: Yes/no.

b. CDA: Free text.

c. CDE Level: Derived from CDE call.

5. Collateral Damage Assessment Graphic Standards. **The JFC may establish a policy to consolidate BDA, CDA, and MEA graphics into a consolidated CA-G graphic product.**

a. Utilize ".DIEE" scenario for the strike.

b. Inset the post-strike image and add it to the upper left-hand corner of the template just below the header box and annotate the date of image in the Post-strike text box just below the image inset using the following format: DDMMMYYYY.

c. Annotate collateral damage.

d. Review the CDA-G and complete any missing header information, adjust imagery zoom and annotations to standards in reference g, unless noted in this document.

e. Ensure qualified imagery analysts perform a quality control to ensure all header information matches MIDB, and input the analyst's name.

f. To upload to MIDB, select a file location and name it in the format, "BE_OSUFFIX_CDA-G_YYYYMMDD," as a .jpg file.

ENCLOSURE E

MUNITIONS EFFECTIVENESS ASSESSMENT METHODOLOGY

1. Introduction. The importance of determining if applied military force achieves the desired effects makes MEA an essential component of CA. Common reasons for munitions failing to perform include duds, fuzing errors, influence of the weather, and malfunctions with the delivery platform. Operational reporting and intelligence inputs to this assessment can assist in determining whether weapons operated as intended. J2, J3, and JFE personnel should collaborate to arrive at the most accurate assessment for both MEA and the entire CA. This will provide the JFC with the information required to make timely decisions whether or not to re-attack a given target.

2. Munitions Effectiveness Assessment Definition. MEA compares the anticipated effectiveness calculated in the weaponeering solution to the actual effectiveness of the means employed. MEA evaluates weapon system employed and munitions effectiveness to recommend any required changes to the methodology, tactics, weapon system, munitions, fuzing, or weapon delivery parameters, in order to increase force effectiveness. While MEA explicitly directs the assessment of munitions, MEA concepts apply to nonlethal fires. Timely and accurate MEA answers this essential question for the JFC: "Did the employed munitions perform as expected?"

3. Relationship between Assessments

a. Primarily the responsibility of the J3 and JFE, MEA depends on inputs from and coordination with the J2. The J3 or JFE may conduct MEA concurrently and interactively with the J2 development of BDA.

b. MEA evaluates several weapons parameters including, but not limited to, delivery accuracy, fuzing, and damage mechanisms (i.e. blast, fragmentation, and overpressure). Use systematic trend analysis to identify any deficiencies in specific weapon systems, tactics, or munitions performance.

c. MEA analysts who identify a deficiency in the employed force should work with BDA analysts to recommend the necessary changes to weaponeering solutions, procedures, tactics, or system modifications. Using a variety of intelligence and operations inputs, including Phase 1 and 2 BDA damage/ change assessments, the J3 or JFE prepares a report assessing munitions performance and tactical applications. This report details weapon performance against a specified target type, information that could affect future operations.

d. When feasible, MEA efforts can and should continue after cessation of hostilities, including subsequent on-site inspections collected by teams visiting target locations in-person. For more information, see Enclosure G.

4. Three Components of Munitions Effectiveness Assessment

a. Weapon Hit Indicators (WHI). WHI includes reports or signs confirming that the weapon struck the intended target. There are three categories of WHI:

(1) Category 1. Category 1 involves direct observation of the weapons striking the intended target. Crewmembers of the aircraft employing weapons may observe WHI visually or with the aid of a targeting pod. Other observers could include operators on the ground near the target area, such as a Joint Terminal Attack Controller or an individual with Remote Operations Video Enhanced Receiver.

(2) Category 2. Category 2 involves observation of secondary effects of the weapon in the target area. Indicators include, fire, smoke, cratering, or enemy communication/electronic intelligence indications in the intended target area. An example includes targeting pod video showing weapons striking the target, followed by a distinct secondary explosion.

(3) Category 3. Category 3 includes reports of weapons release in the target area. These reports may appear in either an intelligence report or a MISREP in which the aircrew reports weapons released within intended parameters for the specific target.

b. Weapon Hit Assessment. WHA provides the initial assessment of where munitions impacted in the target area using all available WHIs. WHA is a critical input to determine BDA and complete CA. Complete WHA in the shortest possible timeframe to determine the impact points of weapons using WHI collected during the engagement. For example, if targeting personnel receive a targeting pod video from a strike on a command bunker, complete WHA using Category 2 WHIs (the MISREPs and video showing smoke in target area), which confirmed release of munitions in the target area and good effects. However, when no Category 1 or Category 2 WHI is available, WHA may depend on more than aircrew reports of weapons release within parameters, which is often the case with coordinate-seeking weapons. Additional Category 3 WHI may be required (e.g., imagery products).

c. Battle Damage Indicators. Either quantitative or qualitative, BDI indicate the damage/change of a target after engagement.

(1) Identify BDIs throughout the target area or points to focus collection assets. These may include equipment, buildings, facilities, systems, or signals and emissions associated with the target. BDIs of these observables may

indicate functional or operational changes of the observables due to specific physical changes at the monitoring point. These changes can vary from minimal increased/decreased activity, to the destruction of the observables themselves. Due to the unique relationship between observables and the target, BDIs may provide more powerful evidence of a target's functional status than any other intelligence source.

(2) Note BDIs throughout the process, from the initial WHA to Phase 1 BDA. BDIs can range from temperature changes, to loss of communication abilities, to increased/decreased activity levels. BDIs can exist at locations outside of the target area (i.e. communications from a subordinate unit stating that they have not received any information from a higher echelon). Having a comprehensive list of BDIs and an associated timeline before looking for them provides for the use of all-source intelligence to complete a comprehensive look at holistic BDA. For example, BDI for a command bunker could include indications of weapons impacting the northeast corner of the bunker, as that is the location of the known power generator.

5. Weapons Effect Modeling

a. If at any time during the BDA process (but ideally during the MEA process) analysts realize that the weapons did not hit the desired impact point, or weapons not intended for the target were used, weapons effect modeling can help in determining an assessment of intended effects. Weapons effect modeling leverages known information about the target, to include critical components and locations of nodes, weapons, and weapons impact locations, and inputting the information into the Joint Munitions Effectiveness Manual Weaponeering System (JWS) or Integrated Munitions Effects Assessment (IMEA) to understand the achieved effects.

b. An example of weapons effect modeling would be if the predetermined weaponeering solution called for 4x GBU-31v3 bombs, but the pilot released only 3x GBU-31v3. Place the impact points of those munitions into JWS or IMEA, and use the computed information to make an assessment on the functional damage of the target.

c. Weapons effect modeling can provide information that may not be available by any other means and could make the assessment process more expedient and accurate.

6. Lethal Weapon Effects and Damage Mechanisms. Most munitions provide a specific effect but utilize a combination of damage mechanisms. The two main damage mechanisms are blast and fragmentation. Consider will be the size of the crater, damage pattern (from impact, fragmentation, and debris), and effective blast radius.

a. Damage Mechanisms. Damage mechanisms describe how munitions affect a target.

(1) Blast is the shock wave generated by the explosion of a weapon resulting in a quick rise in pressure and temperature, followed by a much slower decline to below ambient air pressure (eventually returning to ambient pressure). For BDI, the critical number that applies to blast is the miss distance. Fragmentation damage results from dispersion and projection of high-velocity fragments of the detonated bomb. The fragment size, shape, and mass vary by munition and purpose.

(2) Fragmentation pattern, impact velocities, fragment sizes, and center of vulnerability will be critical elements for BDI determinations.

(3) Penetration and cratering are mechanisms to place damage within a structure, whether concrete on a runway, inside a building, or through an underground facility. Bomb hits and crater sizes are essential BDI assessment factors for penetration and cratering. Fuze selection and planning the impact angle can influence all of these mechanisms.

b. Influencing the Effect. The effects caused by the munitions determines the characteristics for BDI; however, other factors may influence the effect. Two critical considerations of a weapon's effect are fuzing and impact angle. Choose when and how the munition should detonate to accomplish specific damage.

c. Impact Angle. As part of weaponeering and mission planning, the impact angle can be crucial to generating the right effect. Impact angle will influence the blast and fragmentation pattern, crater size, and probability of penetration. Impact angle choice usually relates to the target type and used in concert with a fuze type to optimize target damage. Normally predetermine this as part of the weaponeering solution during Phase 3 of the JTC, Capabilities Analysis.

d. JWS and Weapons Effect Modeling. JWS and IMEA describe required weapons effects for kill types for specific target sets. Impact angle and fuzing data is provided based on each kill mechanism. Use this information to create models of fragmentation patterns expected for a weapon at a certain impact angle, fuze option, and velocity. Although generated for weapons effect estimates, these models prove useful in predictive BDI.

e. JDPI graphics and WHI/BDI support to MEA. Providing JDPI graphics to BDA/MEA analysts will assist in identifying the intended aim point to assess whether the munitions performed as expected. WHI and BDI data provides the analysts with evidence that the weapon was in the appropriate geospatial location prior to terminal maneuver and that the weapon functioned properly. Provide MEA analysts with a complete ETF, including the JDPI graphics, and

the required damage levels with definitions for the target type, acceptable bomb hit miss distances, and predictive fragment and blast graphs if available.

7. Confidence Levels. A MEA depends on the type and quality of available data; therefore, use a qualifier for the analyst's confidence level. The three terms used to identify MEA confidence are CONFIRMED (≥95 percent confidence), PROBABLE (50 to 94 percent confidence), and POSSIBLE (<50 percent confidence). The JFC may provide additional guidance. The wide dissemination of MEA reports requires a consistent understanding of the confidence levels to exist across the targeting enterprise.

8. Munitions Effectiveness Assessment Databasing Standards. **Database MEA in the BDA remark of the ETF for a target in MIDB as a free text message.** Provide J2 inputs for the J3 and JFE to investigate and understand any potential weapons failures, delivery errors, or other reasons for a munition to fail.

9. Munitions Effectiveness Assessment Graphic Standards. **The JFC may establish a policy to consolidate BDA, CDA, and MEA graphics into a consolidated CA-G.**

a. When producing MEA-Gs, use analyst's rank, first initial, and last name instead of "D" number (e.g., TSGT J. DOE).

b. Insert a pre-strike image into the upper left-hand corner of the template just below the header box, and annotate the date of image in the pre-strike text box below the image inset using the following format: DDMMMYYYY.

c. Make no annotations in the inserted pre-strike image.

d. Insert a post-strike image into the template, and annotate the date of image in the post-strike text box centered between the image inset and the right edge of the template below the header using the following format: DDMMMYYYY.

e. Annotate JDPI, weapon impact location/effects, weapon type, fuzing, and delay as applicable in the following format.

(1) Line 1: JDPI ID

(2) Lines 2-3: Munitions effects (e.g., CRATER CONSISTENT W/ WPN DELIVERY, IMAPCT PATTERN CONSISTENT W/ AB WPN)

f. MEA-Gs will contain a text box, oriented immediately to the right of the lower graphic classification box and running the remaining length of the image,

possessing analyst comments detailing any weapon performance abnormalities or unexpected effects.

g. Review the MEA-G and complete any missing header information. Adjust imagery zoom and annotations to standards in reference g, unless noted in this document.

h. Ensure qualified imagery analysts perform a quality control of the product to ensure all information in the header matches the EFT and inputs their name.

i. To upload to MIDB, select a file location and name it in the format, "BE_OSUFFIX_MEA-G_YYYYMMDD," as a .jpg file.

ENCLOSURE F

RE-ATTACK RECOMMENDATION METHODOLOGY

1. Introduction. An accurate RR provides the commander with systematic advice on whether to re-attack a target to achieve desired effects. According to JP 3-60, RRs and future target nominations combine the BDA and MEA to compare results with the MOEs developed in Phase 1 of the JTC (reference c). The J2 (informed by BDA) and the J3 and JFE (informed by MEA) share responsibility for the RR. Provide recommendations quickly to enable the JFC to affect the operational decision cycle. **A valid and informed RR directly supports the overall purpose of CA to determine the degree of success in creating desired targeting effects and achieving targeting objectives. Use RR to formulate follow-on actions to support the JFC's objectives.**

a. RR Process. The RR process considers when targets may require re-attack, based on the threat's remaining capability, capacity, and intent, as well as its potential for recuperation. This process concludes the CA and attempts to solve deficiencies identified during the BDA and MEA processes. A reassessment of targeting objectives, target selection, target vulnerabilities, operational timing, as well as the employed tactics, weapons, and munitions, factor into new recommendations for the JFC. An accurate and informed CA will reduce the risk to aircrews and aircraft by not sending them back after targets already destroyed. Additionally, CA may improve the fuzing, munitions load, and other weapons parameters of the armament.

b. RR and Future Operations. Future targeting recommendations range from attacking different targets to changing munitions or delivery tactics. Consider the relative importance of the target to the target system, the current targeting effort, and overall operation.

2. Four Types of Re-attack Recommendation

(1) NO RE-ATTACK: Effects achieved against the target, and the threat will not recuperate during the campaign.

(2) IMMEDIATE RE-ATTACK: Effects not achieved against the target, and the priority of the target requires additional assets within the current operations cycle.

(3) DELIBERATE RE-ATTACK: Effects not achieved against the target, and the priority of the target requires additional assets incorporated in a normal planning cycle.

(4) FUTURE CONSIDERATION: Effects achieved against the target, but the adversary may recuperate the target to a point where re-attack may be required during the campaign. Couple this recommendation to the recuperation time of the targeted element.

3. Target System Analysis and Re-attack Recommendation. The three phases of BDA determine whether target engagement achieved the functional damage/change necessary to meet the JFC's objectives. When assessing the target's function *vis-à-vis* the overall target system, review the TSA completed during Phase 2 of the JTC. Continuous TSA updates will improve the accuracy of the RR and help achieve desired effects to meet the JFC's objectives. In the absence of a completed TSA, review the significance and expectation statements completed during Basic and Intermediate Target Development, as these fields describe the target's importance and impact on the given target system.

4. Reasons for Recommending Re-attack. Reasons for RR may include, but are not limited to:

a. Munition Anomalies. The munition failed to operate as intended, usually by failing to go high order. For example, a 2,000lb munition dropped on an adversary's HQ fails to achieve the JFC's intent for 30 percent structural damage. A BDA analyst might note the lack of damage on available imagery, and a MEA analyst might note the same, possibly informed by weapons systems video or a MISREP. Combine these two inputs for RR, based on current operational situation and the JFC's criteria to achieve desired effects.

b. Functional Damage/Change Not Achieved. If the function of the target was not altered or neutralized as intended, consider a RR based on current targeting objectives. For example, a weapon system video and MISREP confirm that a 2,000lb munition dropped on an adversary's HQ went high order, and the Phase 1 BDA analysis reports PROBABLE light functional damage (perhaps due to size of the structure or increased structural reinforcement not reported during initial target development). BDA confirms light functional damage and the combined BDA/MEA assessments recommend re-attack with additional munitions with new weaponeering solution, based on an updated target intelligence assessment.

5. Reasons for Not Recommending Re-attack. J2, J3, and JFE personnel must recognize and reinforce the need to take a measured approach to combat employment and only use the amount of force necessary to achieve the JFC's objectives. **Recommending re-attack due to available ordnance or to achieve a sense of target destruction—rather than achieving desired effects—violates law of war.** Reasons not to recommend re-attack may include, but are not limited to:

a. The target function changed sufficiently to meet the JFC's objectives.

b. Lost Element of Surprise. If the engaging force loses the element of surprise, the enemy situation has changed and operational knowledge of this fact might preclude continuing offensive operations against a hardened and prepared adversary.

c. Threat to Friendly Forces. If intelligence identifies a new, substantial threat to friendly forces (i.e. enemy air or maneuver forces), the risk to friendly forces may outweigh the potential gains of re-attack. Weighing this decision against military necessity, brief the JFC on the increased threat, as well as the enemy target function and capability to the adversary's course of action.

d. Overcome by Events. Changes to the situation on the ground might no longer require re-attacking the target to achieve desired effects, despite a lack of munitions effectiveness.

e. Collateral Damage. During the course of CA, if a CDA confirms the loss of civilian or noncombatant live or unintentional harm to their property, it may be prudent to delay the RR until informing the JFC on the second- and third-order effects of collateral damage. However, per reference g, the JFC inherently reserves the right to determine the acceptable level of risk for combat engagement.

6. Combat Assessment Fusion. As a shared operational and intelligence task, a complete CA results from close coordination and collaboration between J2, J3, and JFE personnel. Beginning in training, the joint force should establish and implement a CA fusion process to ensure that MEA and BDA inform RR rapidly during operations.

7. Re-attack Recommendation Databasing Standards

a. **Database the RR in the BDA remark of the ETF for a target in MIDB. Capture the J2 and J3's recommendation based upon BDA, CDA, and MEA.**

b. Restrike Recommendation: Yes/No.

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ENCLOSURE G

POST-CAMPAIGN OPERATIONS ACTIONS

1. Post-campaign Operations Purpose. The CA process does not end when hostilities cease. When force protection conditions allow, establish MEA exploitation teams to collect empirical data to inform the BDA and MEA components of CA. This data collection effort is essential to:

a. Evaluate the full extent of target physical damage/change and functional damage.

b. Determine the true effectiveness of the asset-target interaction.

c. Critique and improve the BDA analysis and reporting process.

d. Critique and improve weaponeering and CDE tools and methodologies along with their associated data.

e. Critique and improve target characterization support tools.

2. Post-campaign Operations Activities

a. To the maximum extent possible, RESPRODs will enter all physical and functional damage into MIDB and ensure that those specific records reflect the current operational status. Generally group data as operational, intelligence, and MEA exploitation data. Collection of operational or mission-specific data includes executed mission-specific orders (including all executed air tasking orders), MISREPs, pre-impact bomb hit indication messages transmitted by net-enabled weapons, and copies of aircraft cockpit video or weapon system video. Intelligence information includes national and tactical intelligence gathered during the operation as well as continued post-conflict damage assessment and analysis of reconstruction activities.

b. When feasible, deploy MEA exploitation teams (including engineers, intelligence analysts, and targeting officers) to conduct onsite analysis of the damage from the ground-level perspective. Ground-level analysis bridges the gap of knowledge between the level of damage the BDA collection assets observed, revealed, or collected during hostilities and the actual physical damage/change and functional damage to the adversary's targets and target systems.

c. As the MTC Executive Secretariat, JS Targeting serves as the responsible organization to ensure the collection of this information (see reference l).

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ENCLOSURE H

DAMAGE AND CHANGE DEFINITIONS

1. Introduction. Standardized damage definitions provide analysts, operators, and commanders with a common understanding of a particular damage assessment. Standardized damage definitions support a JFC's decision on whether targeting achieved operational objectives or whether to order a re-attack.

2. Organization. The appendix to this enclosure includes damage definitions that include the following information:

a. Physical damage/change assessment definitions for specific types of target elements. Note: The damage definitions for the types of targets provided in Appendix A do not apply to targeting conducted with nuclear weapons. See reference f for nuclear damage definitions.

b. FDA considerations for each target.

c. FDA definitions.

3. Supplemental Damage Definitions. If an operation requires damage definitions not available in this manual, work with the lead Service component employing the weapon(s) that result in the unique definition requirements, to determine new damage terms consistent with Service weapon capabilities and collected effects data. Incorporate these new damage terms into the JFC's BDA CONOPS to ensure theater BDA production and federated partners are aware of and train with the new terms. If new physical damage/change terms are necessary, establish them as a combination of the target and engagement type. Future revisions of this manual will incorporate new damage definitions as required.

4. Physical Damage Confidence Levels. As discussed in Enclosure C, PDAs require a confidence level associated with the damage assessment. Use the definitions for confidence levels:

a. CONFIRMED: Visually or otherwise assured through one or more objective sources, to include weapon system (aircraft cockpit) video, GEOINT, signals intelligence, measurement and signature intelligence, and/or human intelligence with virtual (≥95 percent) certainty. No inference involved.

b. PROBABLE: 50 to 94 percent likelihood of the accuracy of the damage assessment. Little inference required because of reliable data sources.

c. POSSIBLE: <50 percent likelihood of the accuracy of the damage assessment. Requires considerable inference.

5. Change Assessment Confidence Levels. As discussed in Enclosure C, change assessments require a confidence level to reflect that analyst's confidence level. Use the following confidence level definitions: CONFIRMED (≥95 percent confidence), PROBABLE (50 to 94 percent confidence), and POSSIBLE (<50 percent confidence).

APPENDIX TO ENCLOSURE H

DAMAGE AND CHANGE DEFINITIONS FOR SPECIFIC TARGETS

1. Introduction. This appendix addresses the subjective input to BDA. These definitions narrow the choices used to describe the level of physical damage/change and functional damage, so that the JFC receives concise information required to make decisions on whether or not to re-attack.

2. Damage Narrative. In addition to determining the physical and functional damage levels, provide a damage narrative that describes the damage or observed change. Consider the following items for each target element assessed when writing a damage narrative:

a. Target Element PDA

(1) What type of BDA source information did you use?

(2) What does the physical damage to the target element look like (inside/outside)?

(3) What is the level of physical damage?

(4) What is your confidence in the PDA?

(5) What physical damage characteristics can you not assess from the available information?

b. Assessment of Target Functionality

(1) How does the physical damage affect the target element's ability to function?

(2) How quickly can the loss of function be recuperated?

c. Overall Target Effect

(1) How important is this target element to the whole target?

(2) Have we achieved the desired effects, or should we re-attack the target element?

3. Physical Damage Assessment Definitions and Functional Damage Assessment Considerations for Specific Military Targets. The following pages

provide PDA definitions and FDA considerations for various types of military targets.

Bridges (Permanent and Temporary)

PDA Definitions

NO DAMAGE—No apparent/observable damage.

LIGHT DAMAGE—Superficial damage to bridge, but roadway, deck or floor is undamaged.

MODERATE DAMAGE—All spans intact, but one or more spans damaged with holes in the deck or floor. For pontoon bridges, one pontoon section sunk.

SEVERE DAMAGE—All spans attached, but one or more spans have 50 percent of the deck or floor width destroyed. For pontoon bridges, two or more "non-adjacent" pontoon sections sunk.

DESTROYED—One or more spans dropped; piers or abutments may be damaged/destroyed. For pontoon bridges, two or more "adjacent" pontoon sections sunk.

Notes:

1. When reporting physical damage, report the NUMBER of spans damaged and destroyed out of the total number of spans the bridge contains.

2. The deck or floor of a railroad bridge may be either solid (ballasted-track) or open construction.

FDA Considerations

When reporting MODERATE or SEVERE DAMAGE, address the number of lanes left on the highway bridge (i.e. the level of traffic that can still use the bridge).

MODERATE or greater physical damage to a railroad bridge generally renders the bridge unusable.

Recuperation time may be short for a pontoon bridge assessed as DESTROYED, due to the destruction of a few sections. Several factors (e.g., the presence of spare sections or repair capability) may rapidly negate the effects of an attack, with repair possible even before completing the BDA.

When a permanent bridge span has sustained moderate or severe physical damage (holes or missing portions of deck spans) it may be very difficult to assess the true extent of functional damage to this portion of the bridge. Although the BDA analyst cannot "see" under the bridge, generally, the extent of physical damage to the underside of the span can be greater than the observed deck damage. The potential for greater underside damage is due to the delayed fuzing used to attack most bridges.

Figure 9. Physical Damage Assessment and Functional Damage Assessment Definitions and Considerations for Bridges

Buildings

PDA Definitions

NO DAMAGE—0 percent of the target element area damaged.

LIGHT DAMAGE—Up to 15 percent of the target element area damaged.

MODERATE DAMAGE—15 to 45 percent of the target element area damaged.

SEVERE DAMAGE—45 to 75 percent of the target element area damaged.

DESTROYED—75 to 100 percent of the target element area damaged.

Notes:

1. Framed Buildings—Framed structures (e.g., military HQ, office buildings, and aircraft hangars) rarely collapse totally because of a conventional weapons attack. Regardless of overall damage, the structural-framing members supporting the building tend to remain intact. Collapse of the structural-framing members within a steel or concrete framed building is not necessary to achieve the levels of physical damage stated above. The percentage of target element damage outlined above includes damage to non-load-bearing elements (e.g., facade/external sheathing, broken windows/glass, blown-out curtain walls, and/or blown-out roof panels).

2. Load-Bearing Wall Buildings—In contrast to framed buildings, physical damage levels pertaining to load-bearing wall structures (e.g., buildings with thick walls that carry the floor and roof loads) are generally equal to the percent of building collapse and include load-bearing as well as non-load-bearing structural elements.

3. For high multistory buildings (greater than four stories) or buildings with multiple sections or wings, express the reported level of damage as it relates to both the affected section and wing of the structure as well as the entire building. For example, if a ten-story building receives severe damage to the upper three stories, report the level of damage to those particular floors plus the level of damage to the structure as a whole, which is assessed as moderate damage.

4. For buildings with multiple wings, report destroyed wings and damage to the remainder of the structure. For example, at a HQ building, the north and south wings were destroyed while the center section received moderate damage.

FDA Considerations

A building is designed to environmentally shelter the enclosed function or equipment. Destruction of the building is not required; rather, destruction of the critical element(s) inside should be the objective. The greater the extent of physical damage to the building, the greater the likelihood of destroying the critical element(s) and the longer the required recuperation time to restore the function.

Although there is a correlation between the level of physical damage to a building and functional damage to its critical element(s), the location and hardness of a building's contents are key to a meaningful functional assessment. For example, in an industrial building, the machinery may be less vulnerable than the structure in which it is contained. In such a structure, floor damage is a better indicator of functional effect than structural damage. The structure might be moderately damaged with the machinery receiving little or no damage. On

the other hand, in a HQ building that contains fragile computer or electronic equipment, the equipment may be destroyed before the structure is significantly damaged.

When assessing framed structures, it may be more difficult to determine functional damage to the building's contents because framed structures are less likely to collapse (i.e. exhibit less apparent physical damage). In contrast, wall-bearing structures tend to collapse more easily (i.e. exhibit more apparent physical damage) and are more likely to functionally damage the structure's contents.

When reporting recuperation, report both the structure's recuperation and the critical element's recuperation.

General weaponeering guidance considers a building unusable (i.e. functionally destroyed) when it has sustained 50 percent structural damage. Depending on the type and location of critical elements, a lesser percentage of damage may be adequate to achieve the desired level of functional degradation.

In asymmetric warfare, however, a building that has received 50 percent structural damage, and therefore considered no longer usable for its intended purpose, may now be optimally usable as a hide location for snipers and improvised-explosive device placement. In other cases, a building may serve as an important landmark or other symbol of national unity and resolve. In these cases, the entire building may be the critical element.

Figure 10. PDA and FDA Definitions and Considerations for Buildings

Bunkers

PDA Definitions

NO DAMAGE—No apparent/observable damage.

LIGHT DAMAGE—No apparent weapon penetration into the bunker observed; however, damage to exterior is apparent.

MODERATE DAMAGE—Weapon perforation into the bunker observed.

SEVERE DAMAGE—Less than 1/3 of bunker roof/side walls collapsed.

DESTROYED—Greater than 1/3 of bunker roof/side walls collapsed.

Note: Evidence of successful internal weapon detonation requires incorporation of all-source, fused intelligence data. Those indicators that can be provided by imagery or visual collection means include entrance doors blown off, burn marks outside entrances, and/or venting of smoke caused by fire or secondary explosions through openings other than the weapon penetration hole(s) (i.e. doors or air vents). Analysis of aircraft cockpit video is essential to the assessment process of all types of hardened structures (e.g., bunkers, silos, and tunnels). Video will show the venting of weapon blast energy through doors and ventilation shafts. Compare video to information on the internal configuration of the bunker to determine approximate weapon detonation location relative to the critical elements.

FDA Considerations

Extensive use of thick concrete, burster slabs, and soil layers, as well as facility size, generally precludes a partial collapse or physical destruction of the structure from a single weapon. Although external physical damage may be limited, a high-order weapon detonation inside the structure will generally destroy the contents. An accurate assessment of the extent of internal physical and functional damage requires knowledge of bunker construction (i.e. dimensions, placement of walls, and roof/floor/wall thickness).

Functional damage to a bunker depends on the structure's mission. If the structure serves in a storage capacity (e.g., for aircraft or munitions), depending upon internal compartmentation, a weapon penetration usually results in damage/destruction of the contents. In these situations, depending on the degree of physical damage, the damaged contents can be removed and the bunker can sometimes be reconstituted to serve as a protective structure for new equipment/supplies.

When the bunker serves in a production or C2 role, a successful weapon penetration and detonation generally results in the damage or destruction of its mission/operations. In these situations, the extent of functional damage depends on fused, all-source intelligence estimates of physical damage to the internal structure, ventilation system, electronic/communication equipment, power supplies, lights, water lines, or tools/equipment. Generally, long recuperation times are associated with this type of internal damage.

As with buildings, when reporting recuperation, report both the structure recuperation and the critical elements recuperation.

Figure 11. PDA and FDA Definitions and Considerations for Bunkers

Dams and Locks

PDA Definitions

NO DAMAGE—No apparent/observable damage.

DAMAGED—Dam/lock breached (or penetration of dam/lock face) leading to seepage on downstream side.

DESTROYED—Dam/lock has burst, resulting in the inability of dam/lock to operate and to contain water on upstream side.

FDA Considerations

For this target category, the FDA definitions are contained within the PDA definitions. Collateral effects are always major concerns for this target set.

Figure 12. PDA and FDA Definitions and Considerations for Dams and Locks

Distillation Towers

PDA Definitions

NO DAMAGE—No apparent/observable damage.

LIGHT DAMAGE—No apparent penetration of tower shell or disruption to piping connections; however, portions of the insulation covering the tower shell appear damaged and/or scorched.

MODERATE DAMAGE—Tower shell remains standing; tower penetrated by weapon(s), or shrapnel and/or piping connections deformed or severed.

DESTROYED—Tower is at least partially collapsed or toppled.

Note: When reporting physical damage to a specific tower, include damage or lack of damage to equipment directly associated with the tower. This equipment will usually include one or more furnaces, heat exchangers or condensers, and elevated pipe ways. If identified, report damage or lack of damage to the control building associated with the distillation tower. Distillation tower targets include the tower and all associated equipment.

Analysts providing assessments for this type of target should be mindful of any classification restrictions when providing reports to higher headquarters, especially if coalition partners are part of the targeting and assessment processes.

FDA Considerations

The effects of damaged distillation towers on a target's production capabilities depend on the specific functions of the towers (e.g., primary distillation or secondary processing). Express functional damage of distillation towers in terms of time required for repair or replacement and specific production capabilities denied. It is important to report damage to equipment directly associated with a distillation tower because the results could be comparable to inflicting significant damage to the tower.

Figure 13. PDA and FDA Definitions and Considerations for Distillation Towers

Electronic Data and Information Technology Systems

Physical Damage or Change Assessment Definitions

NO EFFECT—No apparent/observable effect.

MANIPULATED—Some or all of the data or program has been falsified or modified, so that it is intentionally wrong or deceptive.

DEGRADED—The information technology systems, applications, or data on a target reduced to a level represented as a percentage of capacity (e.g., 45 percent) for a specific period. Specify the level and duration of degradation achieved, if known.

DISRUPTED—The information technology systems, applications, or data on a target reduced by 100 percent for a specific period. Specify the duration of disruption achieved, if known.

DESTROYED—The information technology systems, applications, or data on a target reduced by 100 percent permanently, completely, and irreparably. Since enough time and effort could restore virtual targets, destruction of virtual targets may only be "effectively permanent," based on the requirements and objectives of a mission.

Notes:

1. Electronic data consists of the information components that exist on devices, computers, or computer networks. These components include items of stored information (e.g., text, number, or graphics), data packets (i.e. formatted control information), and software.

2. An attack on electronic data can be performed locally (at the targeted device) or through connectivity (networks). Consider an attack on the target set as physical damage or change. Manipulating electronic data has a certain physicality, but depending on the type of attack, it may be better classified as "change."

FDA Considerations

Recuperation of electronic data relies heavily on back-ups and/or connectivity.

Figure 14. Physical Damage/Change and FDA Definitions and Considerations for Electronic Data and Information Technology Systems

Ground Force Personnel—Military Units

PDA Definitions

NO DAMAGE—No apparent/observable casualties or damage to occupied positions or organic equipment operated by ground force personnel.

ATTRITED—Up to 30 percent visible casualties or damage to occupied positions or organic equipment.

SEVERELY ATTRITED—More than 30 percent visible casualties or damage to occupied positions or organic equipment.

Notes:

1. For equipment, use the damage definitions for military equipment.

2. Occupied positions (e.g., bunkers, structures, or trenches) or equipment (e.g., personnel carriers or trucks) that have been damaged/destroyed will result in casualties.

3. In addition to providing PDA definitions, when reporting BDA against ground force personnel, provide the best estimate of total percentage destroyed.

4. For indirect fires, thirty percent casualties or materiel damage inflicted during a short timespan normally renders a unit ineffective. However, the JFC will stipulate the type of effects desired against specific target categories to achieve operational objectives.

FDA Considerations

Numerous factors influence the attrition of ground forces in combat: physical (e.g., personnel, weapons systems, and sustainment), morale, training, and leadership. Generally, the greater the personnel casualties and damage to their equipment and supply lines, the greater the ground forces attrition and the lower their combat effectiveness. As part of determining enemy combat effectiveness, clearly address two factors: (1) reconstitution of forces and recuperation of facilities, and (2) residual capabilities to perform defense, assault, and supply missions.

Desertions or prisoner of war losses may render a unit ineffective.

Figure 15. PDA and FDA Definitions and Considerations for Ground Force Personnel—Military Units

Ground Force Personnel—Individuals

PDA Definitions

UNHARMED—No evidence of individual captured, wounded, or killed.

CAPTURED—Positive identification and corroborated evidence of individual detained within U.S. or coalition partner-controlled facilities.

WOUNDED—Positive identification and corroborated evidence of individual wounded.

KILLED—Positive identification and corroborated evidence of individual killed.

FDA Considerations

For wounded individuals, identify the type and estimated duration of the wounds, as well as information on how the individual's ability to function is degraded. For example, a terrorist cell leader with a broken leg has limited physical mobility but can still direct and lead the terrorist cell.

Figure 16. PDA and FDA Definitions and Considerations for Ground Force Personnel—Individuals

Military Equipment (Deployed and in Depots)

PDA Definitions

NO DAMAGE—No apparent/observable damage.

DAMAGED—Physical deformations may include holes in equipment, scorching visible on exterior, and/or equipment components blown off (e.g., broken tracks/wheel or armored plates). Major components still intact.

DESTROYED—Unrepairable, possibly scrap. Catastrophic damage (K-kill).

Notes:

1. Make careful consideration when reporting NO DAMAGE. In certain cases, physical deformations may not be observed. Use multiple sources/types of information for analytical judgments (e.g., no vehicular movement for extended periods or lack of detectable radio transmissions).

2. When reporting physical damage, report the total quantity seen and the number of pieces of equipment damaged or destroyed.

3. Generally, define military equipment as:

a. Armored vehicles: Tanks and armored personnel carriers

b. Artillery: Towed and self-propelled field and antiaircraft artillery systems

c. Trucks: All types of non-armored vehicles

d. Locomotives and rolling stock: All types of rail transportation

e. Aircraft: All types of fixed and rotary wing aircraft

f. Rockets: Multi-round and single-round rockets and their associated launchers

g. Missiles: Fixed and mobile surface-to-surface and surface-to-air missiles and associated launchers.

h. Radar antennas: Stand-alone or attached to van or trailer. Radars may or may not be associated with a missile site

i. Fire control components: Vans and trailers (e.g., radar, guidance, power, and computer) associated with antiaircraft, surface-to-surface, and surface-to-air missile sites

FDA Considerations

The DAMAGED category to equipment generally equates to the partial or complete disruption of the equipment's functionality as follows, although in some cases, visible damage may have only minimal or no effect on equipment functionality (refer to JWS browser for detailed "kill" definitions):

a. Armored vehicles and artillery: Affects equipment's firepower capability (F-kill) and/or its mobility (M-kill). This damage is not repairable by the crew on the battlefield.

b. Trucks: Prevents vehicle mobility (M-kill) and/or internal equipment usage for a number of hours until repairs can be made.

c. Locomotives and rolling stock: Prevents mobility (M-kill) for a number of hours until repairs can be made. Materials within rolling stock cars may be damaged/destroyed.

d. Aircraft: Prevents takeoff (PTO-kill) for a number of hours until repairs can be made.

e. Rockets/missile or launcher: Prevents successful/effective firing (F-kill) of the weapon. This damage is not repairable by the crew on the battlefield.

f. Radar antennas or their associated vans/trailers: Prevents radar system from performing its intended function, either missile firing (F-kill) or target acquisition/target tracking, until repairs can be made.

g. Functional damage of equipment reduces the functional capability of C2 nodes; of logistics nodes to perform tasks of fuel, arm, fix, transport, man, and protect; and of engineering resources to provide mobility, counter-mobility, and survivability support.

The level of functional damage of a missile or radar site depends on the extent of damage, the number/redundancy of critical elements and their damage, and interconnectivity of the various elements that make up the site.

For armored vehicles, artillery, and trucks, refer to the section on Ground Force Personnel FDA considerations for additional information.

Figure 17. PDA and FDA Definitions and Considerations for Military Equipment

Petroleum, Oil, and Lubricants (POL) Storage Tanks

PDA Definitions

NO DAMAGE—No apparent/observable damage.

LIGHT-MODERATE DAMAGE (aboveground tanks)—Top and/or side walls punctured, possible spillage of contents; no evidence of sustained fire; structural integrity remains intact.

LIGHT-MODERATE DAMAGE (underground or partial underground)—Weapon penetration of tank confirmed; no evidence of secondary explosion or sustained fire.

DESTROYED—At least partial collapse/buckling of sidewall, or, evidence of sustained fire and/or a secondary explosion.

FDA Considerations

Express significant functional damage of a POL storage installation in terms of storage capacity rendered unusable and the time required to repair or replace denied capacity. Although a POL tank may have sustained damage, its contents may be retrievable and usable.

Figure 18. PDA and FDA Definitions and Considerations for Petroleum, Oil, and Lubricants (POL) Storage Tanks

Power Plant Turbines and Generators

PDA Definitions

NO DAMAGE—No apparent/observable damage.

DAMAGED—No apparent weapon penetration of unit, but the environmental housing over the unit has sustained damage and is disfigured. The unit may be displaced from its foundation.

DESTROYED—Turbine or generator unit is breached/penetrated and has extensive structural deformation, or the unit appears torn apart. Catastrophic damage (K-kill).

Notes:

1. When reporting physical damage, report the number of turbines or generators damaged and destroyed out of the total number of units at the facility.

2. One type of power plant consists of freestanding, gas turbine generator units. These units are in the open, enclosed in a thin metal environmental housing, and can operate independently of each other.

3. The other more common type of power plant consists of a multistory framed building (called the generator hall) that contains multiple turbine and generator units. Physical damage to the turbine/generator units may be difficult to identify if the generator hall remains relatively intact. Therefore, damage estimates to the units are based on the weapon detonation location and physical damage to the building itself. The closer to the floor that a weapon detonates, the greater the probability of unit damage. The extent/location of structural damage, vice roof panel damage, to the building is another indicator of unit damage. The greater the extent of wall damage and structural collapse, the greater the likelihood that the unit(s) are damaged or destroyed under the rubble.

4. When performing BDA on a generator hall, report physical damage to both the building (refer to the section on buildings) and an estimate of turbine/generator damage located inside.

FDA Considerations

Destruction of one turbine/generator unit will partially degrade the electrical production function of a power plant. These target components are an example of machinery being less vulnerable than the structure in which it is contained. The generator hall may be moderately damaged, while the turbine/generator unit(s) contained within the building may have received little damage.

When reporting recuperation, report both the structure recuperation and the turbine/generator recuperation.

Figure 19. PDA and FDA Definitions and Considerations for Power Plant Turbines and Generators

Rail Lines and Rail Yards

PDA Definitions

NO DAMAGE—No apparent/observable damage.

CUT—Track(s) cratered, which prohibits movement around the damaged area. Movement around or past the damaged area (choke point or rail yard) is still possible on other lines.

DESTROYED—Multiple tracks with multiple cuts to prevent rolling stock from moving around or past damaged area (choke point or rail yard).

Note: With these definitions, express the functional capability of the rail yard.

FDA Considerations

The location of rail yard "cuts" and the ability of the yard to bypass the damage will determine the extent of functional damage to the facility.

Recuperation time may be short for DESTROYED rail yards, due to the presence of new rails and repair equipment/manpower.

Figure 20. PDA and FDA Definitions and Considerations for Rail Lines and Rail Yards

Roads

PDA Definitions

NO DAMAGE—No apparent/observable damage.

CRATERED—Road cratered, but vehicles are able to maneuver around damaged section of roadway.

CUT—Road and adjacent shoulders with multiple craters in line and sufficiently close enough together to prohibit vehicle movement through the cratered area of road surface.

Note: Where geographically possible, an alternative to damaging a road with crater(s) is to attack the adjacent hillside to cause a landslide to cover the road.

FDA Considerations

The effectiveness of attacks on roads depends on the ability to reduce or stop the level of traffic flow. Factors used to estimate flow reduction and road repair requirements (typically, roads can be rapidly repaired) include the extent/ability to bypass the damaged road section by using the terrain adjacent to the shoulder, depth and width of cratered area, and availability of repair equipment and personnel.

Figure 21. PDA and FDA Definitions and Considerations for Roads

Runways and Taxiways

PDA Definitions

NO DAMAGE—No apparent/observable damage.

CRATERED—Runways/taxiways cratered, but aircraft able to maneuver around for taxi/flight operations.

CUT—Runways/taxiways with multiple craters in line and sufficiently close enough together to prohibit aircraft movement around the cratered area. However, taxi/flight operations (including aircraft launch) could occur beyond the cut.

INTERDICTED—Runways/taxiways with multiple cuts sufficiently close enough together to prevent takeoff/landing operations between the cuts and/or last cut and runway overrun.

Note: In assessing physical damage to runways and taxiways, the functional capability of the runway or taxiway is also implied.

FDA Considerations

Base the effectiveness of an attack on a runway/taxiway on the ability of surface cratering to prevent aircraft takeoff or landing. To achieve interdiction, no undamaged part of the runway/taxiway is long enough or wide enough for use as a takeoff surface. Takeoff/landing capabilities of the aircraft located at the airfield must be known to successfully assess runway/taxiway damage. Assess nearby roads for possible aircraft use.

The critical factor when assessing runway/taxiway damage is knowledge of the type/category of aircraft that can use the airfield. Consider a fighter or bomber base interdicted if normal operations of the aircraft stationed there are precluded. However, the airfield may be usable by other aircraft types using an unimproved runway. Refer to the appropriate aircraft documents for specific aircraft minimum clear takeoff length and minimum clear takeoff width dimensions.

Successful interdiction of all available runways, taxiways, and parking aprons large enough to be used as take-off surfaces must occur before an airfield, in total, can be assessed as INTERDICTED.

Figure 22. PDA and FDA Definitions and Considerations for Runways and Taxiways

Satellite Dishes

PDA Definitions

NO DAMAGE—No apparent/observable damage.

LIGHT DAMAGE—A few reflective panels blown off.

MODERATE DAMAGE—Less than 25 percent of the dish's reflective panels are blown off, plus there is damage to the dish support structure and/or damage to the feedhorn.

SEVERE DAMAGE—25 to 60 percent of reflective panels blown off, plus some deformation of the dish and/or the dish's structural components. Antenna pointing changed.

DESTROYED—Feedhorn destroyed and/or greater than 60 percent of reflective panels blown off, and/or extensive structural deformation of the dish, and/or dish knocked off its base.

FDA Considerations

Functional degradation to sites will depend on damage to the dish and/or its associated control building(s). When making this assessment, knowledge of the dish type (i.e. fixed or tracking) and location of the damage is critical.

Figure 23. PDA and FDA Definitions and Considerations for Satellite Dishes

Ships

PDA Definitions

NO DAMAGE—No apparent/observable damage.

MODERATE DAMAGE—Physical deformation, holes in ship/ship's equipment, and/or ability to move/maneuver reduced.

SEVERE DAMAGE—Greater than 1/3 of superstructure/deck area destroyed or burned, and/or major subsystems inoperable (e.g., weapon sensors or radar), and/or ability to move/maneuver destroyed.

DESTROYED—Greater than 1/3 of the ship's waterline length is flooded (uncontrolled flooding). Sinking ship. The ship's major subsystem supporting operations destroyed.

Note: When determining the level of physical damage, consider the following:

a. Seaworthiness: Listing (in degrees), capsized, sunk.

b. Firepower: Level of damage to guns/launchers/magazines (described according to functions: surface-to-air, surface-to-surface, antisubmarine); damage to flight deck, hangars, and aircraft elevators.

c. Mobility: Percent damage to steering/rudder(s), percent degradation to speed (of sustained speed capability).

d. Sensors: Search (including air-to-surface and subsurface), radars/sonars, and fire control in terms of percent damage and type of damage.

e. C2: Damage to pilot house/bridge, combat information center, communications center/antennas, computer systems, and data links. Address all in terms of percent, type, level of damage, and estimates of reconstitution times.

FDA Considerations

The type and location of damage will determine the ship's ability to continue operations and the requirement to conduct shipyard repairs. When assessing functional damage, address the ship's ability to move and maneuver, and the degree of disruption to particular ship subsystems (e.g., weapons delivery capability or sensors).

Figure 24. PDA and FDA Definitions and Considerations for Ships

Steel Towers

PDA Definitions

NO DAMAGE—No apparent/observable damage.

DAMAGED—Damage to support member(s), but the tower remains standing.

DESTROYED—Tower collapsed or toppled.

FDA Considerations

The level of functional damage associated with a physically damaged steel tower will depend upon the tower's function and its connectivity with other target elements. Examples of steel tower usage/functions include electric power transmission and communication antenna support.

Figure 25. PDA and FDA Definitions and Considerations for Steel Towers

Transformers

PDA Definitions

NO DAMAGE—No apparent/observable damage.

DAMAGED—The structure of the unit is intact but appears blackened as a result of a fire or leakage of oil.

DESTROYED—The structure of the unit appears torn apart or extensively distorted. Catastrophic damage (K-kill).

Note: When reporting physical damage, include the total number of transformers and number damaged or destroyed.

FDA Considerations

The effect of transformer damage on the target's function depends on the power requirements of the facility and the ability to reroute the power.

Figure 26. PDA and FDA Definitions and Considerations for Transformers

Tunnel Entrances or Portals

PDA Definitions

NO DAMAGE—No apparent/observable damage.

LIGHT DAMAGE—No damage to the portal, but the tunnel entrance is partially blocked by the crater or debris. If existing, the tunnel doors can be opened/closed and are passable.

MODERATE DAMAGE—No damage to the portal, but the tunnel entrance is completely blocked by the crater or debris. If existing, the tunnel doors cannot be opened/closed or the doors have been blown off.

SEVERE DAMAGE—Partial collapse of the portal; entrance completely blocked.

DESTROYED—Complete collapse of portal.

Notes:

1. Depending on the hardness of tunnel entrances and number/type of weapon employed, a complete collapse of the portal may or may not occur.

2. A portal may be referred to as an "adit."

3. When possible in reporting damage to tunnel entrances, include the estimated volume and size of the debris/rubble pile that blocks the entrance. This debris data can assist in estimating entrance clearing/recuperation times.

FDA Considerations

Physical damage to a tunnel entrance generally makes the entrance impassable. It may reduce the protection to the facility's internal contents in follow-on attacks. The extent of functional damage depends on the size of the crater, degree of portal collapse, or amount of debris blocking the entrance.

Functional damage depends on the purpose of the tunnel facility. For example, a storage-type tunnel facility is much more vulnerable to tunnel entrance damage than a C2 tunnel facility, which is less dependent upon ingress into and/or egress out of the tunnel entrance. The time required to repair tunnel entrances depends on the extent of damage and the availability of personnel and equipment. Underground facility may include multiple entrances.

When reporting the functional damage to tunnel entrances, take into account the number of damaged entrances to the total number of entrances to assess the overall accessibility to the facility.

Figure 27. PDA and FDA Definitions and Considerations for Tunnel Entrances or Portals

Tunnel Facility Air Vents

PDA Definitions

NO DAMAGE—No apparent/observable damage.

DAMAGED—Vent opening partially blocked by the crater or debris; vent structure may be damaged.

DESTROYED—Vent opening completely blocked by the crater or debris.

FDA Considerations

For this target element, base the functional damage on the amount of airflow through the vent. Multiple air vents may have to be destroyed to completely close off airflow into or out of the facility.

Air vents are an essential component of some tunnel facilities, bringing in fresh air and removing exhaust. In some cases, closing off the air vents will make an internal function inoperable. If the facility is purely for material storage, the vents are usually less critical, but they may become increasingly critical if there are personnel and operating equipment inside the facility.

When reporting the functional damage of the facility vents, take into account the number of damaged vents to the total number of vents to determine the overall (percentage or volume) airflow through the facility.

Figure 28. PDA and FDA Definitions and Considerations for Tunnel Facility Air Vents

Virtual Personas

Change Assessment Definitions

NO CHANGE—No functional change or observed damage to the virtual persona.

MANIPULATED—Influences to a virtual persona's behavior in cyberspace where the virtual person modifies its normal behavior in response to a known or unknown action in cyberspace.

DEGRADED—The virtual persona's freedom of operation in cyberspace is sporadic and/or degraded by a certain percentage, due to technical interference or network outages.

DISRUPTED—The virtual persona is unable to maintain freedom of operation in cyberspace for a specified time. Specified time could be hours, days, weeks, or months.

Notes:

1. A virtual persona is an entity that exists and operates in cyberspace to perform one or more functions for the threat. A virtual persona may be associated with one or more individuals.

2. If the change/damage definitions do not address the specific type of virtual persona engaged, use best judgment to characterize the nature of the change/damage.

FDA Considerations

When assessing the functional change/damage for a given target, consider all target elements, not just the target element engaged.

Figure 29. Change and FDA Definitions and Considerations for Virtual Personas

FDA Definitions

Use the basic functional damage definitions below in BDA of the target element, target complex, and target system. As a subjective, all-source assessment, FDA requires a confidence level qualifier similar to those used with physical damage to convey assessment clarity. Associating a confidence level qualifier with a FDA is optional.

Note: Estimated recuperation time is critical when assessing functional damage.

NO FUNCTIONAL DAMAGE—The target is undamaged or sustained no or minimal damage to critical element(s), causing no decrease in normal functional capability. The target is fully operational or capable of action (i.e. mission ready). This damage level does not require recuperation or replacement times.

LIGHT FUNCTIONAL DAMAGE—The critical element(s) of the target have sustained damage, causing less than a 15 percent decrease in normal operational capability. This damage level requires an estimate of the time required for recuperation or replacement of the target function.

MODERATE FUNCTIONAL DAMAGE—The critical element(s) of the target have sustained damage, causing a 15-45 percent decrease in normal operational capability. This damage level requires an estimate of the time required for recuperation or replacement of the target function.

SEVERE FUNCTIONAL DAMAGE—The critical element(s) of the target have sustained damage, causing greater than 45 percent decrease in normal operational capability. This damage level requires an estimate of the time required for recuperation or replacement of the target function.

FUNCTIONALLY DESTROYED—The critical element(s) of the target have sustained damage rendering the target unusable for its original purpose. The target is incapable of supporting combat or production operations without repair or replacement of critical elements. This damage level requires an estimate of the time required for recuperation or replacement of the target function.

As required, use the following functional damage definitions in situations when the basic definitions above do not apply.

ABANDONED—Regardless of physical damage, this facility or equipment is no longer used for its intended purpose. The target is incapable of supporting combat or production operations without being reoccupied and/or re-equipped.

UNKNOWN FUNCTIONAL DAMAGE—Although the critical element(s) of the target have been attacked, there is insufficient data to assess if any functional damage occurred.

Figure 30. FDA Definitions

FDA Definitions for Nonlethal Attacks

When assessing functional damage for nonlethal attacks, the standard functional damages definitions may not apply. In these situations, use the following:

DEGRADED—The critical element(s) of the target has sustained a partial loss of capability, but is still able to operate at reduced levels. This damage level requires an estimate for remaining capacity and duration of loss.

DISRUPTED—The critical element(s) of the target has sustained complete but temporary loss of capability that prevents the targeted function. This damage level requires an estimate for duration of loss.

MANIPULATED—The target has been deceived or distorted. This damage level requires an estimate of the effects duration.

Figure 31. FDA Definitions for Nonlethal Attacks

ENCLOSURE I

REFERENCES

PART I – REFERENCES

a. Defense Intelligence Analysis Program, August 2011, "Management Guidance"

b. CJCSI 3370.01 Series, "Target Development Standards"

c. JP 3-60, 28 September 2018, "Joint Targeting"

d. DIA-13-1506-006, 9 June 2015 (last updated on 17 March 2016), "Critical Elements Guide"

e. Defense Intelligence Report DI-13-1308-855, 15 August 2013 (last updated on 17 March 2016),"Critical Elements Handbook"

f. DIA DI-2810-05-09, March 2009, "Definitions of Nuclear Damage"

g. CJCSI 3160.01 Series, "No-strike and the Collateral Damage Estimation Methodology"

h. JP 5-0, 16 June 2017, "Joint Planning"

i. NSGI 3103: National System for Geospatial-intelligence Instruction 3103, 6 November 2013, "Geospatial-intelligence Targeting Support Program"

j. U.S. Cyber Command, "Cyberspace Temporary Effects Assessment Report

k. CJCSI 3110.02 Series, "Intelligence Planning Objectives, Guidance, and Tasks"

l. CJCSI 5140.01 Series, "Military Targeting Committee Governance and Management"

PART II—SUPPORTING DOCUMENTATION

1. DIA-2820-2-03, March 2003 (updated on 3 January 2006), “Battle Damage Assessment (BDA) Reference Handbook”

2. CJCSI 3505.01 Series, “Target Coordinate Mensuration Certification and Program Accreditation”

GLOSSARY

PART I—ABBREVIATIONS AND ACRONYMS

BDA	battle damage assessment
BFA-G	battle damage assessment graphic
BDI	battle damage indicator
BHA	bomb hit assessment
CA	combat assessment
CA-G	combat assessment graphic
CCMD	combatant command
CDA	collateral damage assessment
CDA-G	collateral damage assessment graphic
CDE	collateral damage estimation
CJCS	Chairman of the Joint Chiefs of Staff
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
CONOPS	concept of operations
CSA	combat support agency
CTEAR	Cyberspace Temporary Effects Assessment Report
DIA	Defense Intelligence Agency
DIAP	Defense Intelligence Analysis Program
DMG	damage modeling graphic
DPI	desired point of impact
EDA	estimated damage assessment
ETF	electronic target folder
F-kill	functional kill
FDA	functional damage assessment
FSP	functional support plan
GEOINT	geospatial intelligence
HQ	headquarters
IC	intelligence community
ICOD	intelligence cut-off date
IMEA	Integrated Munitions Effects Assessment
ISR	intelligence, surveillance and reconnaissance
J-2	intelligence directorate of a joint staff
J-234	Joint Staff Targeting Division

J-3	operations directorate of a joint staff
J-5	plans directorate of a joint staff
JDPI	joint desired point of impact
JFC	joint force commander
JFE	joint fires element
JIPOE	joint intelligence preparation of the operational environment
JMEM	Joint Munitions Effectiveness Manual
JP	joint publication
JPP	joint planning process
JSTIC	Joint Staff Targeting Integration Cell
JTC	Joint Targeting Cycle
JTCG/ME	Joint Technical Coordinating Group for Munitions Effectiveness
JTF	joint task force
JWICS	Joint Worldwide Intelligence Communications System
JWS	Joint Munitions Effectiveness Manual Weaponeering System
K-kill	catastrophic kill
M-kill	mobility kill
MEA	munitions effectiveness assessment
MEA-G	munitions effectiveness assessment graphic
MGRS	Military Grid Reference System
MIDB	Modernized Integrated Database
MISREP	mission report
MOE	measure of effectiveness
MOP	measure of performance
MTC	Military Targeting Committee
NGA	National Geospatial-intelligence Agency
NIPRNET	Non-secure Internet Protocol Router Network
NTM	National Technical Means
OPLAN	operation plan
PDA	physical damage assessment
POL	petroleum, oils, and lubricants
PTO-kill	prevents takeoff kill
RESPROD	responsible producer
SAM	surface-to-air missile
SIPRNET	Secure Internet Protocol Router Network
SSM	surface-to-surface missile
TSA	target system analysis
TSDA	target system damage assessment

TTP	tactics, techniques, and procedures
USMTF	U.S. Message Text Format
WHA	weapon hit assessment
WHI	weapon hit indicators

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PART II – TERMS AND DEFINITIONS

Additional Damage: Unintentional or incidental injury or damage to persons or objects that would be lawful military targets in the circumstances ruling at the time.

Aim point: 1. A point associated with a target and assigned for a specific weapon impact. 2. A prominent radar-significant feature used to assist an aircrew in navigating and delivering their weapons. See also desired point of impact. (DoD Dictionary. SOURCE: JP 3-60)

Assessment: 1. A continuous process that measures the overall effectiveness of employing capabilities during military operations. 2. Determination of the progress toward accomplishing a task, creating a condition, or achieving an objective. (DoD Dictionary. SOURCE: JP 3-0)

Battle Damage Assessment (BDA): The estimate of damage composed of physical and functional damage assessment, as well as target system assessment, resulting from the application of lethal or nonlethal military force. (DoD Dictionary. SOURCE: JP 3-0)

Battle Damage Indicator (BDI): A measurable phenomenon, either quantitative or qualitative, used to indicate the damage/change of a target.

Change Assessment: The identification and assessment of measurable change to the target resulting from the application of lethal or nonlethal military force.

Circular Error Probable: An indicator of the delivery accuracy of a weapon system, used as a factor in determining probable damage to a target. It is the radius of a circle within which half of the weapons are expected to fall.

Collateral Damage: A form of collateral effect that causes unintentional or incidental injury or damage to persons or objects that would not be lawful military targets in the circumstances ruling at the time. (DoD Dictionary. SOURCE: JP 3-60)

Collateral Damage Assessment (CDA): An analytical judgment derived by determining the amount and effects of collateral damage post target engagement. (CJCSI 3160.01C)

Combat Assessment (CA): The determination of the overall effectiveness of force employment during military operations. See also battle damage assessment, munitions effectiveness assessment, and re-attack recommendation (DoD Dictionary. SOURCE: JP 3-60)

Critical Element: 1. An element of an entity or object that enables it to perform its primary function. 2. An element of a target, which if effectively engaged, will serve to support the achievement of an operational objective and/or mission task. (DoD Dictionary. SOURCE: JP 3-60)

Cyberspace: A global domain within the information environment consisting of the interdependent networks of information technology infrastructures and resident data, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers. (DoD Dictionary. SOURCE: JP 3-12)

Cyberspace Operations: The employment of cyberspace capabilities where the primary purpose is to achieve objectives in or through cyberspace. (DoD Dictionary. SOURCE: JP 3-0)

Desired Point of Impact (DPI): A precise point associated with a target and assigned as the impact point for a single unitary weapon to achieve a desired effect. See also aim point. (DoD Dictionary. SOURCE: JP 3-60)

Estimated Damage Assessment (EDA): An analysis or change assessment that estimates damage using the probability of weapon or capability success. Update and refine these assessments until there is sufficient data to change it from an estimation to an actual assessment. Perform this when no BDA-related intelligence is available but an assessment is required.

Functional Damage Assessment (FDA): The estimate of the effect of military force to degrade or destroy the functional or operational capability of the target to perform its intended mission and on the level of success in achieving operational objectives established against the target. (DoD Dictionary. SOURCE: JP 3-60)

Joint Desired Point of Impact (JDPI): A unique, alphanumeric-coded precise aim point associated with a target to achieve an explicit weaponeering objective and identified by a three dimensional (latitude, longitude, elevation) mensurated coordinate. See also aim point and desired point of impact. (DoD Dictionary. SOURCE: JP 3-60)

Measure of Effectiveness (MOE): An indicator used to measure a current system state, with change indicated by comparing multiple observations over time. (DoD Dictionary. SOURCE: JP 5-0)

Measure of Performance (MOP): An indicator used to measure a friendly action that is tied to measuring task accomplishment. (DoD Dictionary. SOURCE: JP 5-0)

Mission: 1. The task, together with the purpose, that clearly indicates the action to be taken and the reason therefore. 2. In common usage, especially when applied to lower military units, a duty assigned to an individual or unit; a task. (DoD Dictionary. SOURCE: JP 3-0)

Mobile Target: An entity, force, or function capable of operations while on the move. It may remain in one location for a period prior to resuming operations on the move.

Munitions Effectiveness Assessment (MEA): The assessment of the military force applied in terms of the weapon system and munitions effectiveness to determine and recommend any required changes to the methodology, tactics, weapon system, munitions, fuzing, and/or weapon delivery parameters to increase force effectiveness. (DoD Dictionary. SOURCE: JP 2-01) Conducted concurrently and interactively with battle damage assessment, MEA is primarily the responsibility of operations personnel with required inputs and coordination from the intelligence community.

Observable Point: A point (e.g., facility, element, or location) that is monitored to assist in determining damage/change resulting from a military operation. Observable points may or may not be within the targeted facility.

Physical Damage Assessment (PDA): The estimate of the quantitative extent of physical damage to a target resulting from the application of military force. (DoD Dictionary. SOURCE: JP 3-60)

Re-attack Recommendation (RR): An assessment, derived from the results of battle damage assessment and munitions effectiveness assessment, providing the commander systematic advice on re-attack of a target. (DoD Dictionary. SOURCE: JP 3-60) The RR considers objectives achievement, target and aim point selection, attack timing, tactics, weapon systems, and munitions selection. The RR is a combined operations and intelligence function.

Red Team: An organizational element comprised of trained and educated members that provide an independent capability to fully explore alternatives in plans and operations in the context of the operational environment and from the perspective of adversaries and others. (DoD Dictionary. SOURCE: 2-0)

Recuperation Assessment: The estimate of the minimum and maximum amount of time (expressed in hours, days, months, or years) required to restore or replace the targeted function. Recuperation depends on many factors: the level of damage inflicted; the availability of manpower, materials, and transportation facilities; and the national and local priorities assigned to the recovery of the facility.

System: A functionally, physically, and/or behaviorally related group of regularly interacting or interdependent elements; that group of elements forming a unified whole. (DoD Dictionary. SOURCE: JP 3-0)

Target: An entity or object that performs a function for the threat considered for possible engagement or other action. (DoD Dictionary. SOURCE: JP 3-60)

Target Assessment: The estimate of the target functional damage level and the associated recuperation times, with comparison to planned objectives. Base this assessment on the target element assessments, critical elements knowledge, understanding of predictive battle damage assessment, and the commander's objectives.

Target Element: A specific features or part of a target that enable it to function and, which if engaged, may create specific effects on that target. (DoD Dictionary. SOURCE: JP 3-60)

Target Element Assessment: The determination of the target element physical damage/change level (with confidence level), and the functional damage level (with recuperation times), with comparison to planned objectives. Base this assessment on the aim point assessments, critical elements knowledge, understanding of predictive battle damage assessment, and the commander's objectives.

Target Material (TM): Graphic, textual, tabular, digital, video, or other presentation of target intelligence, primarily designed to support operations against designated targets by one or more weapon systems.

Target System: 1. All the targets situated in a particular geographic area and functionally related or a group of targets that are so related that their destruction will produce some particular effect desired by the attacker. (DoD Dictionary. SOURCE: JP 3-60)

Target System Component: A set of targets within a target system performing a similar function. (DoD Dictionary. SOURCE: JP 3-60)

Target System Analysis (TSA): An all-source examination of potential target systems to determine relevance to stated objectives, military importance, and priority of attack. (JP 3-60. SOURCE: JP 3-60)

Target System Damage Assessment (TSDA): The broad assessment of the overall impact and effectiveness of military force applied against an adversary's target system, significant subdivisions of the system, or total combat effectiveness relative to the operational objectives.

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