

Aircraft Combat Damage Reporting Workshop Summary Report August, 2009



**National Defense Industrial Association
Combat Survivability Division**

Aircraft Combat Damage Reporting Workshop Report

On August 20, 2009, the National Defense Industrial Association's (NDIA) Combat Survivability Division (CSD) conducted a workshop on Aircraft Combat Damage Reporting (CDR). The Institute for Defense Analyses (IDA) hosted the workshop at their facility in Alexandria, Virginia. The workshop was sponsored by the Deputy Director, Operational Test & Evaluation/Live Fire Test & Evaluation (DDOT&E/LFT&E). This report identifies a series of findings and recommendations that would improve combat damage reporting.

Background

The NDIA CSD is well known for conducting an annual Aircraft Survivability Symposium at the Naval Postgraduate School in Monterey, California. The CSD has expanded beyond these symposia to tackle specific issues through yearly workshops. Each workshop addresses a specific topic by inviting subject matter experts to analyze the chosen issue and prepare recommendations for the aircraft survivability community to implement. The topic for the 2009 workshop, Aircraft Combat Damage Reporting, was chosen based on the importance of this issue to the warfighter.

The objectives of this workshop were: 1) Identify current gaps in the DoD and Armed Services processes for collecting and sharing aircraft combat damage information, 2) Develop recommendations for aircraft combat damage data collection and reporting across the Services, without imposing burdensome reporting requirements on the warfighter, and 3) Develop recommendations for an OSD level aircraft combat damage reporting system that provides timely, accurate, consistent and complete information on U.S. military aircraft combat damage across all services and areas of operation.

The workshop was planned and organized on three premises:

- Combat damage data is critical to learning what does and doesn't work, to improve tactics, to enhance the survivability of future weapon system design, and to reduce casualties.
- Combat damage reporting consistency and comprehensiveness can be improved across the services while balancing a minimal reporting burden on the warfighter.
- Now is the time to institute change.

Workshop Approach

Leading experts on aircraft survivability and key figures in the DoD acquisition community participated in the workshop. Background information on aircraft combat damage reporting, use and improvement was presented and discussed. The participants developed recommendations for improving future aircraft combat damage reporting within the U.S. Department of Defense. Copies of the presentations and minutes of the discussion are documented in a separate workshop minutes report.

Findings

Aircraft losses and damage incidents in ongoing operations have led to an increased focus on survivability. Combat damage data once captured and reported is used to adapt and modify TTPs, prove the worth of aircraft survivability equipment (ASE) and vulnerability reduction features, enhance survivability in future platforms, enhance safety, reduce casualties, and support live fire test and model validation. The uses of combat damage data, prioritized by the workshop participants, are listed in Table 1.

Table 1. Uses of Combat Damage Data

<ol style="list-style-type: none">1. Reduce casualties2. Increase survivability and effectiveness3. Increase crashworthiness4. Change, adapt and modify TTPs5. Threat Identification6. Prove the worth of vulnerability reduction features7. Aid safety8. Prove the worth of ASE9. Enhance future platform designs10. Refine and focus LFT&E efforts11. Validate models and simulations

The history of combat damage reporting from Vietnam through the present demonstrates the advantages of deploying trained data collection teams to combat theaters. Combat damage reporting as currently performed is much improved, but the objective of the workshop was to further refine and more broadly institute combat damage reporting across the DoD.

A previous Combat Survivability Division (CSD) Aircraft Combat Damage Reporting Study (ACDRS) examined service-specific collection procedures and identified gaps in current reporting systems. The study concluded that the Joint Combat Assessment Team (JCAT) is an effective joint organization for the collection and assessment of detailed combat damage data and that archiving the data with SURVIAC is a successful method of preserving and distributing the data to numerous qualified users.

However, there are weaknesses in the current processes for collecting, analyzing and distributing aircraft combat damage data across the DoD.

- At the start of Operations *ENDURING FREEDOM* and *IRAQI FREEDOM* combat damage data collection capability was not deployed to the theaters of operation. As a result, much of the aircraft damage and loss data prior to 2004 is incomplete. This is particularly true for periods of high operational tempo. This impacted the

understanding of the hostile threat environment during operations and limited the available data that is critical for improving aircraft survivability capability.

- The reporting of enemy engagement of coalition aircraft (e.g., surface to air fire reporting), aircraft damage and losses change with time and vary across theater and Service. These differences greatly complicate the reporting and analysis of aircraft survivability across the DoD.
- There is not a simple top level process for reporting all aircraft combat damage incidents across the DoD.

A strawman improved reporting approach envisioned a two-tier system to improve combat damage incident reporting within the DoD. The first tier would slightly augment existing operational reports to provide a basic alert of the occurrence of a combat damage incident. The focus of this tier would be to capture all incidents, however minor, without a reporting burden on the warfighter. The second tier, fulfilled by a dedicated combat damage reporting organization like JCAT, would then follow up to capture comprehensive detailed data on the incidents. JCAT and SURVIAC would distribute and archive the data.

Existing operational reports could provide a basis for the first tier basic alert. Candidate reports include the Commander's Situation Report, SITREP; the Commander's Operational Report, OPREP-3P or the Aircrew/Aircraft Loss Report, LOSREP. Aviation mission planning systems also contain a wealth of information that could be tapped to autonomously provide content for first and second tier combat damage incident reports.

Military aircraft crashworthiness requirements are deficient because of a lack of data on the actual impact conditions in flight operations. This shortcoming limits the establishment of relevant crashworthiness requirements and the development of effective crashworthiness features such as restraints, deceleration, preserving occupiable space and occupant egress. The capability to automatically record impact conditions with crashworthy sensors and data recorders is fielded on some, but not all, aircraft in the DoD fleet.

Air Force Reserve Combat Logistics Support Squadron (CLSS) units repaired combat damage until three years ago when the mission was assigned to active duty military personnel in the Depots. This Air Force policy inadvertently suppresses submission of battle damage reports (AFTO97) because of the requirement to fix battle damage at the depot level.

Conclusions

It was unanimously agreed that combat damage data is absolutely valuable and essential for understanding the performance of aircraft survivability features in combat. The data serves as a baseline for validation of current survivability designs and development of solutions for vulnerability and susceptibility issues. The increased survivability of U.S. aviation platforms is directly attributable to the knowledge gained through combat damage data collection. It is also imperative that casualties, both fatalities and injuries, be included in the collection and assessment of combat survivability. The need to institutionalize the collection and use of combat

damage data is acute. It is important that a simple and accessible reporting process is institutionalized across the DoD so there is a robust capability to support current and future operations.

A two-tier reporting system is a preferable and workable solution that would enable event tracking and detailed follow-up. It would provide a simple initial report with little or no burden on the warfighter and allow for a more detailed report by a dedicated reporting organization. A two-tier system would ensure the minimum data necessary is captured and distributed while enabling follow on detailed reports.

Tier 1 reporting appears easily achievable. For this report, the minimum essential data is date, time, location, aircraft tail number, status of the airframe, if it was flight or ground damage and personnel casualties (MIA, KIA, WIA, NMC). A simple “check the box” approach would allow for quick data entry into the reporting system that would then be followed up with more detail Tier 2 reporting.

In Tier 2, complete assessments of incidents including depot level repair would be reported by a dedicated combat damage reporting organization such as the JCAT. Tier 2 would include training aviation unit personnel to collect the data when the damage is minor or trained assessors are unable to reach the aircraft before it is repaired. The Tier 2 data would be archived and distributed through a central point in the DoD; SURVIAC has established this capability with the CDIRS database.

Recommendations

Combat damage reporting needs to be improved and institutionalized as a capability within the Services and OSD. The NDIA Combat Survivability Division recommends that:

1. USD(AT&L) assign an office (e.g. P&R) with the responsibility to establish and manage a Tier 1 combat damage reporting system that captures the minimum required data to identify and track all aircraft combat damage incidents. This should be followed up with a more comprehensive detailed collection and assessment, by a dedicated team like JCAT.
2. USD(AT&L) form a qualified study team of operational, survivability and combat damage experts to identify existing operational reports and the modifications necessary to serve as the Tier 1 report with little or no impact on the conduct of military operations. The study team should also examine automated data collection from aviation mission planning systems and data recorders. This team will address how to best ensure data fusion from multiple sources and how to rapidly disseminate the data to those who can benefit from it.
3. The DoD and Armed Services should develop and sustain a robust combat damage collection capability with the following minimum requirements:

- a) A common reporting and data collection requirement should be standardized across the aviation force. Tier 1 reports should be transmitted via secure electronic means according to established operational command reporting procedures with distribution to combat damage reporting organizations in OSD and the Services. Tier 2 reports should be via secure electronic means from the unit, through the JCAT service component, to SURVIAC to enable distribution and analysis across the DoD.
 - b) Each service should develop and maintain a deployable team with a mission essential task of combat damage data collection. Dual-hatting these personnel in tactics, maintenance, or even safety center specialties could allow their continued utilization during periods of limited combat operations.
 - c) Dedicated combat damage collection capability should be required in the formation of all Joint Task Forces. This capability should include trained combat damage assessors from the service with the preponderance of air assets in the task force at a minimum and assessors from each service with air assets in the task force if possible. Each service should establish skill identifiers for qualified combat damage assessors.
 - d) Consideration should be given to how DoD's combat damage data collection capability would be utilized in Defense Support to Civil Authorities both in CONUS (under NORTHCOM) and OCONUS if U.S. flagged civil aircraft are damaged by hostile conventional or asymmetric threat systems.
4. Each Service should review its policy on aircraft battle damage repair to avoid inadvertent impact on combat damage repair reporting such as the requiring combat damage repair only at depot level.
 5. All DoD aircraft should be equipped with crashworthy automated crash sensors and data recording capability which would be tied to CDR reporting.

Summary

This one-day workshop was successful in identifying current gaps in the DoD and Service processes for collecting and analyzing aircraft combat damage information and developing recommendations to improve the reporting with little or no additional burden on combat operations. The NDIA's CSD heartily endorses the above recommendations; we are confident implementation of these recommendations will lead to better understanding of aircraft survivability and ultimately improved combat capability.