

Integrated Survivability Assessment – Guidance

Summary

The Developmental Test and Evaluation (DT&E), OT&E, and Live Fire Test and Evaluation (LFT&E) strategies should be integrated so that the full spectrum of system survivability is assessed in a consistent manner. For some systems, it might be appropriate for Critical Operational Issues (COIs) to address system and/or personnel survivability. Personnel survivability (force protection) must be addressed for systems under LFT&E oversight and should be integrated into the overall system evaluation of survivability.

Best Practices

The evaluation of survivability for many combat systems can be subdivided into assessment of susceptibility (probability of hit), vulnerability (probability of kill given a hit), force protection (measures or features to protect occupants), and recoverability as shown in Figure 1.

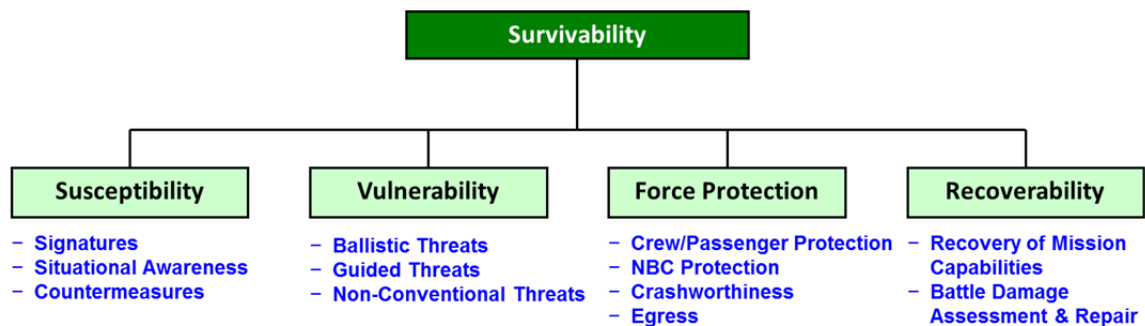


Figure 1. Survivability Evaluation Structure Example

An integrated survivability test strategy might include several operational scenarios or mission threads that guide the design of developmental testing of countermeasure systems, signature measurement, live fire testing of ballistic tolerance, vulnerable area analyses, and force protection assessments. The operational test might use real-time casualty assessment instrumentation to adjudicate force-on-force engagements and generate data on system-level survivability. The probabilities of kill given a hit built into the real-time casualty assessment should have a basis in LFT&E vulnerability assessments. Similarly, the shot lines and end game conditions investigated in LFT&E should have an identifiable basis in realistic threat engagement scenarios, such as those considered in OT&E. DT&E and OT&E testing might provide data on signatures, countermeasure performance, and tactics for use in LFT&E modeling and simulation of force protection analyses. An example overview of the various elements of survivability evaluation is provided below.

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	Survivability			
	DT	M&S	OT	Live Fire Tests
Aircraft Signatures (RF, IR, Visual)		■		
Mission Planning System Effectiveness			■	
Off-Board Sensor Performance	■			
RWR Performance	■			
LAIRCM Declaration Performance	■			
Aircraft Performance	■			
TSAS Sensor Fusion Performance	■			
Situational Awareness (OODA-loop)	■		■	
Aircrew TTPs			■	
RF Threat miss distance		■		
IR Threat Fly-out and Hit Points (HITL)	■	■		
OBIGGS Performance	■			
Threat Tolerance (Vulnerability)		■		■
Force Protection	■	■		■
Repairability				■
Non-Conventional Threat Tolerance	■	■		

Weapons Effectiveness Data

To facilitate integrated survivability analyses and testing, each LFT&E oversight weapons program shall provide weapons effectiveness data to DOT&E for use in the Joint Munition Effectiveness Manuals. LFT&E oversight programs shall provide the data before the weapon achieves initial operational capability and shall prepare the data in coordination with the Joint Technical Coordinating Group for Munition Effectiveness.

Additional Guidance

[Force Protection Guidance](#)

References

[LFT&E Statute: 10 USC 2366](#)

[Defense Acquisition Guidebook, Chapter 9](#)