Guidance

End-to-end testing is the logical means to conduct a mission-based evaluation. End-to-end testing is easiest thought of as testing a mission thread. Mission threads result from a careful analysis of a unit's mission using the system and can be derived from the Joint Mission Essential Task List, from the Component-specific Mission Essential Task List, Concept of Employment (CONEMP), or the Army's Operational Mission Summary/Mission Profile (OMS/MP). The threads should make operational sense and evaluate the intended operational mission from beginning to end. The end-to-end evaluation of each mission thread should rely on testing that includes the entire thread in a single operational event. For example, a rocket or missile end-to-end test would include acquiring the target, passing the target information to a launch platform, firing the rocket or missile, hitting the target, and achieving the intended level of damage.

End-to-end testing is not just interoperability testing; it is simply not enough to verify that critical information can pass throughout the mission thread. The end-to-end evaluation must assess the quality and timeliness of the information as well as the success of mission outcomes. For example, the evaluation of a munition should address the ability of targeting systems to provide accurate and timely targeting data as well as evaluation of whether the intended target is hit and destroyed. The evaluation of a sensor platform should address the unit's ability to provide timely, accurate, and actionable information to the end user. The evaluation of a ship or aircraft should include the performance of all onboard and other supporting systems as well as evaluation of successful mission outcomes.

If it is not possible (due to cost or safety issues) to include all aspects of a mission in a single operational end-to-end test, separate portions of the mission threads can be included in multiple test events. Each of these events should include some overlap, so that the start of test B includes the end of Test A. Conditions affecting mission performance should be duplicated in overlapping events as much as possible. Each test of the thread parts should be operationally representative and all should represent similar operational environments and threats. If separate test events are used, the TEMP should explain why it is not possible to conduct the end-to-end mission in a single event; this is a test limitation, and the TEMP should discuss how this limitation is likely to affect the evaluation, and how the limitation will be mitigated.

For munitions, the end-to-end test can become a critical part of the LFT&E strategy. In an end-to-end test, the target aimpoint is selected operationally. Including this data increases the operational realism of the LFT&E. To be used as part of the LFT&E, full-up munitions must be used, targets must be realistic, and a damage assessment must be completed.

Systems often rely on other systems to complete missions. For these system-of-systems, the test and evaluation should address the impact of all systems to the mission, not just the system under test. It is possible that the system under test meets its requirements, yet cannot accomplish its mission due to the performance of another system.

End-to-End Testing – Guidance

For system-of-systems, end-to-end testing will involve systems other than the system under test. This can complicate test coordination when the additional systems are under the control of another program office. In these cases, DOT&E may require:

- That the availability of the critical system be included among the entrance criteria
- TEMP coordination signatures of the project office(s) responsible for the supporting system(s)

References

Reporting of Operational Test and Evaluation Results, DOT&E, January 6, 2010

Examples