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Test and Evaluation

LIVE FIRE TEST AND EVALUATION

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This instruction provides guidance and procedures for the live fire test and evaluation (LFT&E) of Air Force systems. It applies to all Air Force acquisition programs requiring LFT&E. It implements AFD 99-1, *Test and Evaluation Process*, and LFT&E legislation for systems subject to that legislation. It assigns LFT&E responsibilities to implementing and supporting organizations. The reporting requirements in this instruction are exempt from licensing according to AFI 37-124, *The Information Collections and Reports Management Program; Controlling Internal, Public, and Interagency Air Force Information Collections*, paragraph 2.11.5.

1. General. This instruction provides guidance and procedures for conducting Air Force LFT&E programs. In compliance with LFT&E legislation, the conduct of Air Force LFT&E is a subset of the overall LFT&E program that the Air Force normally accomplishes to satisfy LFT&E requirements to build survivable and lethal combat systems.

1.1. Additionally, compliance with LFT&E legislation will generate additional test and reporting requirements over and above normal Air Force test and reporting requirements. This instruction explains these additional requirements. LFT&E legislation, Title 10, U.S.C. section 2366, chapter 139, contains LFT&E requirements for vulnerability and lethality of covered systems, major munitions programs, and product improvements (that significantly affect vulnerability or lethality) to covered systems and major munitions programs.

1.2. Consult with the Office of the Secretary of Defense (OSD) and Air Force General Counsel offices if necessary to determine whether a system, program, or product improvement is subject to the LFT&E legislation.

1.3. Send inquiries and information requests on LFT & E legislation through standard Air Force chains of command. DoDI 5000.2, DoD 5000.2M, and Title 10 2366 U.S.C. chapter 139, appendix B, provide OSD guidance for implementation of the LFT&E legislation and outlines OSD requirements

for detailed LFT&E plans. AFI 62-201, *System Survivability*, outlines the procedures for the life-cycle management of survivable Air Force systems.

2. Objective. The objective of Air Force LFT&E is to provide a timely and credible vulnerability or lethality evaluation of an acquisition program as it progresses through its development prior to full-rate production or major modification. In particular, the Air Force accomplishes LFT&E to:

- 2.1. Provide information to program decision makers on potential user casualties, and system vulnerabilities and lethality; taking into equal consideration the susceptibility to attack and combat performance of the system.
- 2.2. Ensure LFT&E information is based on valid modeling and simulation, and actual system testing under realistic conditions.
- 2.3. Correct design deficiencies found by LFT&E prior to full-rate production or major modification.

3. Responsibilities of LFT&E Implementing and Supporting Organizations:

3.1. Assistant Secretary of the Air Force for Acquisition (SAF/AQ):

- 3.1.1. Recommends candidate systems to OSD for compliance with LFT&E legislation.
- 3.1.2. Coordinates on survivability or lethality requirements criteria documented in the operational requirements document (ORD) for the system under development.
- 3.1.3. Approves the LFT&E program and allocates Air Force resources required to accomplish the LFT&E program.
- 3.1.4. Approves and sends required LFT&E documentation to OSD.
- 3.1.5. Transmits LFT&E waiver requests (and legislative relief requests, if appropriate) to OSD, as necessary.

3.2. HQ USAF/TE:

- 3.2.1. Coordinates on recommended candidate systems for compliance with LFT&E legislation.
- 3.2.2. Coordinates on survivability or lethality requirements criteria documented in the ORD for the system under development.
- 3.2.3. Coordinates on LFT&E programs for all systems and coordinates on allocation of Air Force resources required to accomplish LFT&E programs.
- 3.2.4. Coordinates on transmittal to OSD of Air Force LFT&E documentation, including briefings and LFT&E waiver requests (and legislative relief requests, if appropriate).
- 3.2.5. Acts as office of primary responsibility (OPR) for LFT&E to assist the single manager (SM) process LFT&E waiver requests (and legislative relief requests, if appropriate) as necessary.
- 3.2.6. Monitors AFMC and SM LFT&E programs.

3.3. HQ USAF/XO. Ensures the ORD for the system requiring LFT&E clearly states the survivability or lethality requirement in operational and output-oriented, achievable, measurable, and testable terms.

3.4. Single Managers (SM):

- 3.4.1. Determines LFT&E requirements for their system.
- 3.4.2. Tasks the LFT&E responsible test organization (RTO) or participating test organization (PTO) to develop and implement the LFT&E program.
- 3.4.3. Plans, programs, and budgets for LFT&E resources, including test articles, facilities, manpower, instrumented threats, and targets. Use Research, development, test and evaluation (RDT&E) funds to support LFT&E, including acquisition of threat targets and munitions or acceptable surrogates.
- 3.4.4. Identifies critical LFT&E issues. Prepares and coordinates required LFT&E documentation to include the test and evaluation master plan (TEMP) and LFT&E plans reports. Review briefings to OSD through standard Air Force chains of command.
- 3.4.5. Conducts engineering assessments and life-cycle cost modeling of possible design changes resulting from LFT&E, if appropriate, and conducts vulnerability reduction or lethality enhancement trade-off studies of the results. Develops a program to incorporate cost-effective design changes as early as possible commensurate with the system acquisition strategy.
- 3.4.6. Prepares LFT&E waiver requests (and legislative relief requests, if appropriate), as necessary, to include an alternative plan for evaluating system vulnerability or lethality.

3.5. Air Force Materiel Command (AFMC):

- 3.5.1. Designates the LFT&E RTO or PTO for Air Force-directed testing.
- 3.5.2. Maintains infrastructure and expertise in the RTO and PTO for LFT&E. The LFT&E RTO for lethality is the 46th Test Wing, 46OG/OGM at Eglin AFB, FL. The LFT&E RTO for vulnerability is Wright Laboratory/FIV at Wright Patterson AFB, OH.
- 3.5.3. Assists the SM in developing a realistic and acceptable LFT&E strategy.

3.6. LFT&E RTO or PTO:

- 3.6.1. Assists the SM in developing the Air Force LFT&E strategy and includes the LFT&E strategy in the TEMP.
- 3.6.2. Assists the SM in development of the LFT&E plan during engineering and manufacturing development.
- 3.6.3. Conducts LFT&E, necessary analysis, and provides reports and data to the SM.

3.7. The Program Executive Officer (PEO) and Designated Acquisition Commander (DAC):

- 3.7.1. Coordinates on recommended candidate systems for LFT&E legislation compliance.
- 3.7.2. Coordinates on the LFT&E program.
- 3.7.3. Coordinates on transmittal to OSD of Air Force LFT&E documentation.
- 3.7.4. Coordinates on survivability or lethality requirements documented in the ORD.
- 3.7.5. Coordinates on LFT&E waiver requests (and legislative relief requests, if appropriate), as necessary, including the alternative plan for assessing vulnerability or lethality.

4. Implementation. LFT&E is a sub-set of developmental test and evaluation (DT&E); the Air Force accomplishes it through a balanced program of modeling and simulation, test, and analysis. Modeling

and simulation and analysis must be an integral part of the LFT&E process because it is unreasonably expensive and impractical to test all possible combinations of threats, aircraft configurations, and environments. See AFPD 6-10, *Modeling and Simulation (S&M) Management*, for modeling and simulation policy guidance. The Air Force must initiate the LFT&E program sufficiently early to allow the results to impact system design prior to full-rate production or major modification. Primary emphasis is on testing and analysis to identify and correct potential design flaws. The LFT&E program should provide an assessment of a system's vulnerability or lethality characteristics relative to the expected spectrum of battlefield threats. The existing Air Force T&E process provides an infrastructure and reporting system which can effectively and efficiently accommodate the requirements of LFT&E.

4.1. The Test Planning Working Group will plan, coordinate, and integrate the LFT&E program in the TEMP.

4.2. You should use the threat assessment working group (TAWG) to gain detailed insight into the system threat assessment report (STAR) and specific descriptions of threats and targets required for simulation. The STAR and TAWG provide the threat (vulnerability) and target (lethality) inputs to the LFT&E portion of the TEMP.

5. Documentation. Title 10 U.S.C section 2366, chapter 139, provides OSD requirements on the format and content for the LFT&E strategy, plan, and report. Include the LFT&E strategy in and submit it with the system TEMP. Submit the LFT&E plan to the program element monitor (PEM) 60 days prior to the start of testing for submittal to OSD for comments. Send LFT&E reports requiring OSD review to the PEM 30 days prior to the due-date to OSD.

6. LFT&E Waivers. (See DoD Manual 5000.2-M, part 11, "Live Fire Test and Evaluation Waiver," and OSD LFT&E guidelines (Title 10 U.S.C. section 2366, chapter 129) for definitions and additional information on requesting LFT&E waivers.) The OSD may waive LFT&E legislation requirements for covered systems, major munitions programs, and product improvements (that significantly affect vulnerability or lethality) to covered systems and major munitions programs where LFT&E would be unreasonably expensive and impractical. Request, process, and have a granted waiver before milestone II. Air Force cannot grant LFT&E waivers after milestone II, except through legislative relief.

6.1. An approved LFT&E waiver exempts a system, program, or product improvement from full-up, system-level testing (full scale, complete system configured for combat, equipped with all fluids, materials, and explosives). However, you must have an alternate plan to evaluate system vulnerability or lethality (such as combinations of analysis, component, sub-system, or sub-assembly testing, etc.) to fulfill the intent of the LFT&E legislation.

6.2. For programs before milestone II, the LFT&E waiver request must include:

6.2.1. An assessment that full-up, system-level testing would be unreasonably expensive and impractical.

6.2.2. An alternate plan to evaluate the vulnerability or lethality of the system, program, or product improvement.

6.3. For programs after milestone II, the LFT&E waiver request must include the information in paragraph 6.2. and include a request for legislative relief along with substantiating rationale on why you delayed the waiver request past milestone II.

6.4. With the exception of the requirement for full-up, system-level testing, the LFT&E requirements for waived LFT&E programs are no less stringent than for non-waived programs; you must include a LFT&E strategy in the TEMP. (OSD provides an independent assessment report to Congress.) Send LFT&E waiver requests (and legislative relief requests if appropriate) through standard Air Force chains of command to the Deputy Secretary of Defense for approval.

HOWARD W. LEAF, Lt General, USAF (Retired)
Director of Test and Evaluation

Attachment 1

GLOSSARY OF REFERENCES

References

DoDI 5000.2, *Defense Acquisition Management Policies and Procedures*, 23 February 1991, and subsequent Air Force supplements.

DoD 5000.2-M, *Defense Acquisition Management Documentation and Reports*, 23 February 1991, and subsequent Air Force supplements.

OSD LFT&E Guidelines (Includes Title 10 U.S.C. section 2366, chapter 139, definitions and detailed LFT&E contents), 27 January 1994

AFPD 16-10, *Modeling and Simulation (M&S) Management*

AFI 62-201, *System Survivability*.