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## **4.4 Test and Evaluation Revised 1/2023**

Test and evaluation is planned and conducted in accordance with the guidelines, standards, and practices found on the FAA Acquisition System Toolset (FAST) to:

- ☐ Provide essential information in support of decision-making for investment programs;
- ☐ Provide essential information for assessing technical and investment risks;
- ☐ Verify the attainment of technical performance specifications and objectives; and
- ☐ Verify and validate that systems, solutions, and capabilities are operationally effective and suitable for the intended use.

The types of test and evaluation standards and processes to be followed for each investment program are based on the milestones and decision points they support and the type of investment program. These test and evaluation standards and processes address: NAS investment programs, NAS modifications, and Mission Support programs.

Best practices require a level of independence between the program management/development role and the test and evaluation role. Test and evaluation results and associated reporting must convey objective system performance information to assist decision authorities in determining whether the product, service, or capability is operationally suitable and effective against agency-defined requirements and FAA operations. Test service teams are uniquely experienced and trained in test and evaluation planning, conduct, and reporting. Their role is to identify shortfalls and operational performance issues that may be otherwise detected late in the lifecycle. For iterative and agile-type programs, the test services team should be included early in the planning of the development process to specify the expected test criteria and objectives for program management of each iteration.

The high-level test strategy is defined in the implementation strategy and planning document. The program management plan specifies how the test strategy will be executed. Based on complexity and criticality, investment programs are required to deliver a test and evaluation master plan (TEMP), as indicated on the JRC checklist. For designated investment initiatives, the TEMP provides more detail than the ISPD and the PMP on contractor and FAA test needs, scope, planning and reporting.

The test and evaluation approach, level of analysis, and test criteria are determined by reporting requirements for program milestones and decisions. The requirements that need to be verified and validated form the basis for test criteria. The risks and complexity of the system, solution, or capabilities being tested drive the scope and robustness of evaluation methods, test cases, and reporting structure.

### **4.4.1 Service Analysis, Concept and Requirements Definition, and Investment Analysis Revised 1/2023**

During service analysis, test and evaluation activities help identify and prioritize critical FAA service needs. During concept and requirements definition, test and evaluation helps to identify the best alternative solutions to those needs. During investment analysis, the criteria for testing operational effectiveness and suitability are expressed as critical performance requirements and

critical operational issues in the program requirements document.

A preliminary TEMP (pTEMP) is developed during initial investment analysis based on the concepts and functions documented in the preliminary program requirements document to support the initial investment decision. An initial TEMP (iTEMP) is developed during final investment analysis once program requirements are finalized and the identity of the most promising solution is known. The iTEMP describes the test program and establishes the basis for test requirements in the request for offer to industry and test costs/and schedules in the acquisition program baseline or execution plan. The iTEMP is required to support the final investment decision. The ISPD and PMP define the plan and schedule for delivery of the final TEMP (fTEMP).

#### **4.4.2 Solution Implementation Revised 7/2020**

Solution implementation activities follow documented and structured T&E processes appropriate to the systems, solutions, and capabilities being tested. Early test and evaluation activity assesses potential operational, safety, and security risks and identifies opportunities for risk mitigation. Later test and evaluation examines performance and operational readiness (suitability and effectiveness) in support of decision-makers at the production, deployment, and in-service decisions.

Each test and evaluation program consists of developmental, operational and site testing as specified in the fTEMP and associated PMP and ISPD, as well as independent operational assessment for designated programs (see AMS Section 4.5). Developmental testing verifies requirements, functional design, and integration of the system, solution, or capability. Operational testing validates achievement of operational needs, as well as the effectiveness and suitability of the solution. For deployable products site testing verifies and validates requirements, design, and suitability of the solution in the fielded environment and configuration. As part of site testing, field familiarization testing may be required to support the site operational readiness decision.

#### **4.4.3 In-Service Management Revised 7/2016**

Developmental, operational and site testing are performed in accordance with documented, structured test processes defined by each in-service management organization in accordance with FAA Orders and Acquisition Management System Policy guidance. This applies to development and implementation of all NAS and Mission Support modifications during the in-service management lifecycle phase. In-service management test processes include standard test approaches that define the phases and detailed activities to be included during testing. These processes also support/and ensure that safety risk management and information system security requirements are addressed.

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