

## TASK 405

### DETAILED ENVIRONMENTAL TEST PLANS (DETP)

405.1 Purpose. This task calls for detailed plans for conducting environmental tests required to determine if the environmental criteria developed in Task 404 are met and their associated critical issues are satisfied, and to identify critical environmental threshold values for system effectiveness that may be evident during testing. Environmental test plans are prepared by materiel developers, evaluators, assessors, and testers in various levels of detail during the acquisition cycle. Development and operational testers prepare plans for testing in laboratory and natural field/fleet environments.

- a. Laboratory test plans. This task pertains mainly to plans for materiel tests performed in environmental laboratories. The laboratory DETP provides the acquisition activity with plans for environmental laboratory tests early in the development cycle.
- b. Natural environment field/fleet tests. The information in 405.2 and following may be used as examples of some of the types of environmental testing procedures that are useful guidelines for some development and operational test plans. These plans are influenced automatically by previous environmental engineering tasks. Agency EES normally assist in preparing these plans.

405.2 Approach. Use decisions and data obtained through the tailoring process to determine the need for laboratory tests, specific criterion values (settings) for the individual environmental test methods in Part Two of this document, and the types and timing of development or operational tests in natural environments. Early coordination with the development and operational test community is essential to facilitate preparation of DETPs and to avoid costly omissions or duplications in environmental test planning. Consider the following:

- a. Probability of occurrence of specific environmental forcing functions, alone or in combination.
- b. Occurrence of similar environmental stresses in more than one life profile phase.
- c. Experience from other materiel similarly deployed/tested.
- d. Expected environmental effects and materiel failure modes.
- e. Expected effects on hardware performance and mission success.
- f. Likelihood of problem disclosure by a specific laboratory test method using a specific chamber test sequence/setting or natural environment test location/method.

405.3 Contents. Include the following in DETP's:

405.3.1 Pretest information. Include the following in the test plan as information that is required prior to conducting an environmental test.

- a. Background data of each item:
  - (1) Item nomenclature, model, serial number, manufacturer, etc.
  - (2) General appearance/condition.
  - (3) Specific physical anomalies.
  - (4) Environmental test history of the specific test item.
- b. Pretest data on the functional parameters that will be monitored during and after the main test. Use functional parameters and operational limits specified in the materiel specification or requirements document. If such specifications are not provided, establish and apply appropriate parameters/limits for the pretest, during the test, and the post test.
- c. Pretest information for facility operators. (Additional information may be required in specific methods in Part Two of MIL-STD-810G.)
  - (1) Test facilities (if applicable) including instrumentation.

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- (a) apparatus
  - (b) fixture(s)
  - (c) heating or cooling provisions
  - (d) requirements for combined environment
- (2) Test item installation details.
- (a) procedures for installation including test item configuration relative to a fixture
  - (b) orientation
  - (c) interconnections
  - (d) pretest setup photographs as appropriate
- (3) Test instrumentation, monitoring, and recording.
- (a) schedule
  - (b) individual test duration of exposure
  - (c) axes of orientation
  - (d) level criteria and tolerances
  - (e) method of test stress application
  - (f) shutdown procedures
  - (g) completion criteria
  - (h) test item functional and operational requirements for pretest, during test, and post test
- (4) Test procedure:
- (a) schedule
  - (b) individual test duration of exposure
  - (c) axes of orientation
  - (d) level criteria and tolerances
  - (e) method of test stress application
  - (f) shutdown procedures
  - (g) completion criteria
  - (h) test item functional and operational requirements for pretest, during test, and post test

405.3.2 During test information. Include the following in the test plan as data to be collected during the test.

- a. Environmental design parameters and test criteria.
- b. Test configuration and quantity of items to be tested.
- c. Description of the testing to be performed, including specific climatic categories in which tests are conducted, subtests (e.g., initial examination (including packaging adequacy), pretest data (see 405.3.1, above), storage, performance, operational modes, human factors, safety, etc.), and failure criteria.
- d. Test procedure criteria, limits and tolerances.
- e. Test sequence and schedule.
- f. Test instrumentation, including, but not necessarily limited to:
  - (1) Specific instrumentation, calibration criteria, and procedures.
  - (2) Data to be collected and accuracies to be achieved.
  - (3) Description of all filtering performed on data.
- g. Descriptions of test installations, facilities, and equipment currently available to the contractor or available for procurement for the specific test program.

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- h. Facilities/equipment required from the Government and dates required.
- i. Data reduction/analysis techniques and statistical criteria.

405.3.3 Post test information. Include the following in the test plan as information that is required after conducting the main test.

- a. Test item identification (manufacturer, model/serial number, etc.).
- b. Test equipment identification, including accessories.
- c. The actual test sequence (program) used or procedural anomalies.
- d. Deviation from the planned test program (including explanation).
- e. Performance data collected on the same parameters at the same operational levels as those of the pretest (including visual examination results and photographs, if applicable).
- f. If not tested in a chamber (e.g., vibration test), room ambient test conditions recorded periodically during test period.
- g. Other data as specified in the individual methods or materiel requirements document(s).
- h. Initial failure analyses.
- i. A signature and date block for the test engineer/technician to certify the test data.
- j. Photographic record of the test item, test fixture, and test apparatus, as appropriate.