

DATA ITEM DESCRIPTION

Title: DURABILITY AND DAMAGE TOLERANCE (DADT) TEST REPORT

Number: DI-SESS-81485A

Approved Date: 20150602

AMSC Number: F9548

Limitation:

DTIC Applicable:

GIDEP Applicable:

Preparing Activity: 11 (AFLCMC/EZFS)

Project Number: SESS-2015-039

Applicable Forms:

Use/Relationship: The report describes the durability and damage tolerance test program to include design development and full-scale tests as required by MIL-STD-1530 including facilities, hardware, procedures, loads and environments, inspections, results, evaluations, and conclusions. The report identifies changes and additions necessary to update the durability and damage tolerance analyses based on test results. The report documents the economic life of the airframe to include estimates of the onset of Widespread Fatigue Damage (WFD) and contractor recommendations for structural inspections or modifications to fleet aircraft as a result of testing.

- a. This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by the specific and discrete task requirements as delineated in the contract.
- b. This DID interfaces with DI-SESS-81983, Durability and Damage Tolerance (DADT) Analysis Report.
- c. This DID supersedes DI-MISC-81485.

(Copies of these documents are available online at <http://quicksearch.dla.mil>.)

Requirements:

1. Reference documents. The applicable issue of the documents cited herein, including their approval dates and dates of any applicable amendments, notices, and revisions, shall be as specified in the contract.
2. Format. The contractor's format is acceptable.
3. Content. The report describes the contractor's test program for compliance with durability and damage tolerance test reporting requirements of the contract and requirements associated with testing in Tasks 2, 3, and 4 of MIL-STD-1530. The report shall include the following:
 - a. Photographs and descriptions of the test facilities, test articles, equipment, and test setup. Structural deviations of the test article from the operational configuration shall be stated with supporting rationale.

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- b. Descriptions and sketches of the instrumented locations of the airframe, and the types and quantities of load, strain, and displacement monitoring devices. Descriptions and sketches shall also be included of the system used to apply and control loads on the test article. The report shall document the procedures used to calibrate the test loads. As part of the report, load peaks and valleys monitored during testing shall be stored on suitable media and made available to the government upon request. Labeling of the data shall allow the government to identify the recorded parameters.
- c. Description of the loads spectra applied to the test article. Deviations from the spectra used in the durability analyses shall be stated with rationale. Rationale for load clipping, truncation, elimination, or substitution of load cycles to include the results of verification testing shall be provided. Description of load sequencing or other methods to incorporate "marker bands" in the test spectra shall be included with rationale and supporting test evidence to verify test equivalence and effectiveness of the method.
- d. Chemical, thermal, and environmental conditions imposed on the test article during all periods of testing.
- e. Description of all pre-test strain surveys performed and predictions vs. measurements data for all locations.
- f. Comparisons of analytical spectrum vs. design test jack loads in terms of durability crack growth analysis at key control points to assess adequacy of the test.
- g. Comparisons of "actual" vs. "command" vs. "design" test jack loads in terms of durability crack growth analysis at key control points for each block of testing to assess adequacy of the test.
- h. Criteria used for determining the success or failure of structural components in the test article. The report shall provide rationale for repairs, replacements, or modifications of components that cracked, failed, or experienced functional impairment during testing and the implementations to fleet aircraft. The report shall state the basis for test termination of the full-scale test article and of individual components.
- i. List the locations, dimensions, and orientations of flaws artificially induced into the test article and damaged incurred in testing that is allowed to remain in the test article during the damage tolerance phase of the test. A table shall be provided of test inspection times (i.e., simulated flight hours, cycles, or pressurizations cycles), detected damage, crack sizes, and changes or repairs made to the test article during testing. The table shall also list the methods used to detect damage at each inspection time. Damage detected in any teardown inspection required by the contract and results of residual strength testing necessary to comply with the contract shall be listed in separate tables.
- j. The report shall document the results of fractographic or metallurgical examinations and the determination of the initial quality by determining the equivalent initial flaw size for all fatigue cracks found during durability testing.
- k. List design changes, repairs or replacements, or in-service inspections recommended by the contractor for operational aircraft as a result of durability and damage tolerance testing and residual strength tests.
- l. Detailed descriptions of test article configuration changes during the course of testing.
- m. The economic life of the airframe based on the results of durability testing.
- n. The report shall provide evaluations of the test and inspection results and identify critical structural areas of the airframe not previously identified by analyses of development testing.

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Changes to the previously predicted crack growth rates, critical crack sizes, and critical locations necessary to update the durability and damage tolerance analyses shall be stated.

o. Cost and schedule data associated with test execution, inspections, repairs, and modifications.

End of DI-SESS-81485A.