

**DATA ITEM DESCRIPTION**Form Approved  
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project(0704-0188), Washington, DC 20503.

<b>1. TITLE</b>  Damage Tolerance Analysis Report		<b>2. IDENTIFICATION NUMBER</b>  DI-MISC-81487	
<b>3. DESCRIPTION/PURPOSE</b> 3.1 The report identifies the airframe locations analyzed for damage tolerance. 3.2 The report details the assumptions, methods, procedures, and results of the airframe damage tolerance and residual strength analyses. 3.3 The report identifies inspection intervals and techniques necessary to detect crack growth damage in service. 3.4 The report defines damage acceptance limits for honeycomb, bonded, and composite structures used in damage tolerance critical structures.			
<b>4. APPROVAL DATE</b> (YYMMDD) 950731	<b>5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)</b> F-ASC/ENFS	<b>6a. DTIC APPLICABLE</b> X	<b>6b. GIDEP APPLICABLE</b>
<b>7. APPLICATION/INTERRELATIONSHIP</b> 7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by the specific and discrete task requirement as delineated in the contract. 7.2 This DID supersedes DI-T-30724. <div style="text-align: right;">(Continued on Page 2)</div>			
<b>8. APPROVAL LIMITATION</b>		<b>9a. APPLICABLE FORMS</b>	<b>9b. AMSC NUMBER</b> F7162
<b>10. PREPARATION INSTRUCTIONS</b> 10.1 <u>Format</u> . The contractor's format is acceptable. 10.2 <u>Content</u> . The report details the assumptions, computational methods, and analytical results of the damage tolerance analyses required by the contract. 10.2.1 Reports shall include revised analyses that employ refined material data from the design development test program and shall include any additional analysis of locations identified as critical in the full-scale test program. The report shall also be amended to incorporate updated analyses necessary as a result of subsequent evaluations. 10.2.2 The report shall state the criteria used to identify airframe locations as critical for damage tolerance. 10.2.3 The report shall provide a fracture critical parts list of the airframe components identified as critical for damage tolerance and shall include sketches of those areas. 10.2.4 The report shall list the material properties assumed in the damage tolerance analyses. 10.2.4.1 For metallic materials, the data shall include material designations, product forms, yield strengths, threshold stress intensity values, critical fracture toughness values, crack growth rate functions, and crack growth rate data plots for the critical thicknesses and grain directions. <div style="text-align: right;">(Continued on Page 2)</div>			
<b>11. DISTRIBUTION STATEMENT</b> DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.			

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## Block 7, APPLICATION/INTERRELATIONSHIP (Continued)

7.3 The address for Defense Technical Information Center (DTIC) submittals is:

Administrator  
Defense Technical Information Center  
ATTN: DTIC-FDAC  
Bldg 5, Cameron Station  
Alexandria VA 22304-6145.

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## Block 10, PREPARATION INSTRUCTIONS (Continued)

10.2.4.2 For composite materials, the data shall include material designations, pertinent geometries, thicknesses, layup orientations, threshold strengths for tensile and compressive collapse, elastic moduli for the critical fiber or layup directions, and glass transition temperatures.

10.2.5 For components utilizing bonded, honeycomb, or advanced composite types of construction, the report shall define damage acceptance limits for impact, compression, delamination, and disbonding.

10.2.6 The report shall state the sources from which the material properties were derived for the damage tolerance analyses.

10.2.7 The report shall document the stress intensity solutions, the crack growth retardation or crack closure models, load interaction functions, spectrum load counting and arranging methods, crack growth rate shifting functions used to account for varying stress ratios, the methods used to account for bending, bearing, and tension, and the critical crack size estimation methods used in the crack growth analyses. The report shall also state the relationships between the numbers of cycles in the load spectra and the numbers of flight hours and ground-air-ground or pressurization cycles.

10.2.8 The report shall provide the data and plots of the dimensions of the predicted cracks and the numbers of flight hours, pressurizations, or ground-air-ground cycles predicted by the damage tolerance analyses from the growth of the assumed initial damage tolerance flaw sizes until the point failure of the part or until four lifetimes, whichever occurs first.

10.2.9 For each part analyzed that indicates unstable, rapid crack propagation or failure, in less than two lifetimes or inadequate residual strength, the report should state the contractor's plans to modify the area or identify inspection times and recommended inspection techniques.

10.2.10 As part of the report, the data points used to generate the plots of the dimensions of the predicted cracks, load cycles, and the corresponding values of stress intensity per applied stress level ( $K/\sigma$ ) shall be labeled and stored in ASCII format on standard personal computer disks or magnetic tapes for delivery to the government upon request. Labeling of the tapes or disks and the information contained therein shall be adequate for the government to identify the crack lengths and depths, and corresponding load levels, accumulated load cycles, and  $K/\sigma$  values.

10.2.11 Also as part of the report, the design service loads and stress spectra used in the damage tolerance analyses shall be labeled and stored in ASCII format on standard personal computer disks or magnetic tapes for delivery to the government upon request. Labeling of the tapes or disks and the information contained therein shall be adequate for the government to identify the loads and stresses, stress types (bearing, bending, tension, and compression), and the associated load levels and numbers of applied cycles with the corresponding analyses that were conducted.