

REVIEW AND APPROVE ANALYSES

JOB FUNCTION 3

1. OBJECTIVE.

This chapter provides the procedural guidance used to confirm the findings of compliance for any part of the design covered by analyses.

2. GENERAL.

This process begins when any one of three situations arise:

- * The applicant proposes analysis as the method of demonstrating compliance with the regulations.
- * An analysis is provided to support the validating of the proposed test.
- * Comparative data are presented for approval.

3. PREREQUISITES

- * Knowledge of the CAA regulatory and airworthiness requirements
- * Successful completion of the Airworthiness Inspectors Indoctrination, or previous equivalent

4. REFERENCES

- * FAA Order 8110.4C Chapter 2 Par.2-6g
- * FAA AC21-40A Guide for obtaining a Supplemental Type Certificate Chapter 5 Data

5. PROCEDURES

- A. Determine that the basis for the analysis is technically suitable and satisfactory to show compliance to the regulations.
 - (1). Establish the specific purpose of the analysis.
 - * Show compliance
 - * Technically accurate
 - (2). Assess that assumptions, data, and design conditions used in the analysis are valid and produce conservative results.
 - (3). Verify the analysis methodology.
 - * Determine that the data and methods used for the analysis are applicable, yet sufficiently conservative to account for unknowns.
 - * Review previous analysis if available.
 - (4). Verify that data used in the analysis are rational, based on industry standards, or on previously approved data (e.g., component reliability data, oxygen flow rates, flammability)
 - * Review previously approved reports/analyses.
 - * Review source documents for values.

- * Determine acceptability of computer-derived data or simulations.
- B. Determine that the analysis is complete, accurate, and addresses its specific purpose.
- (1). Confirm the analysis is complete and that details that can affect the outcome are considered, e.g.:
 - * A basic loads analysis establishes the applied loads (flight, ground, landing, etc.) which are determined from weight, center of gravity, power, and aircraft aerodynamic characteristics using design speeds, and load and safety factors specified in the certification basis.
 - * Structural analyses establish mathematically that the appropriate structural strength requirements have been met. These analyses build on the basic loads and material allowable data and may include: static stress, fatigue, fails safe, damage tolerance, etc. The applicant should assure that the analytical methods and assumptions used are applicable, that all pertinent loading conditions have been addressed, and that appropriate margins of safety have been shown for all structural elements. While review the analysis report, consider the material selection, material design allowable, applied loads (mechanical system design).
 - * Safety assessments evaluate the effects of foreseeable failures of the aircraft structure and/or systems. The analysis must consider malfunctions and damage from external sources, multiple and undetected failures, the effects on airplane and occupants, stage of flight and operating conditions, crew warning cues, corrective action required, capability of detecting faults.
 - * Fail-safe analysis must consider alternate or redundant failure paths, common cause failure.
 - * Electrical load analysis must consider power distribution & factors of safety (circuit protection), load shedding.
 - * Consider Environmental factors (heat, vibration, EMI), as appropriately.
 - (2). Review analysis, as appropriate
 - * Validate assumptions made
 - * Check calculations
 - * Review applicant's validation of computer-derived data or simulations, to include applicability and limitations of software.
 - (3). Determine whether the analysis meets the requirements of the applicable certification basis.
- C. Resolve with the applicant any questions or discrepancies found in analysis.
- (1). Identify and document areas in analysis in which questions or discrepancies exist.
 - (2). Resolve any questions with applicant.
 - (3). Request additional data/analysis, if required.
 - (4). Review applicant's additional submittals in response to CAA request (see Steps A. & B.)
- D. Approve the analysis.
- Verify the analysis compliance to applicable regulations and approve it. Notify the applicant of approved analyses.