

MIL-A-8869B(AS)  
20 May 1987  
SUPERSEDING  
MIL-A-8869(ASG)  
18 May 1960

## MILITARY SPECIFICATION

### AIRPLANE STRENGTH AND RIDIGITY NUCLEAR WEAPONS EFFECTS

This specification is approved for use within the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

1.1 Scope. This specification establishes the basic nuclear weapons effects requirements for airplanes which are intended to deliver nuclear weapons or operate in a nuclear conflict environment.

#### 2. APPLICABLE DOCUMENTS

##### 2.1 Government documents.

2.1.1 Specifications. The following specification forms a part of this specification to the extent specified herein. Unless otherwise specified, the issue of this document shall be that listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS), and supplement thereto, cited in the solicitation.

#### SPECIFICATIONS

##### MILITARY

MIL-A-8868	Airplane Strength and Rigidity, Data and Reports.
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(Copies of specifications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Naval Air Engineering Center, Systems Engineering and Standardization Department (Code 93), Lakehurst, NJ 08733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.
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AMSC N/A

FSC 1510

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2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 Nuclear environment. The airplane shall be at all points, positions, locations, and attitudes within a nuclear environment generated by the explosion of nuclear weapons, as specified by the contracting activity in applicable contractual documents or as established in the conference per 3.2.

3.1.1 Delivery and escape. The airplane shall be capable of safely withstanding the transient phenomena and loads resulting from the explosion fields of nuclear weapons for which delivery capability is specified in applicable contractual documents. The maximum responses shall be determined for all critical components exposed to the most severe conditions of a nuclear environment generated by the weapons explosion fields resulting from applicable delivery and escape modes. These responses shall be presented together with the description of the associated components and the substantiation of the response limits. The determination of the magnitude and distribution of loads resulting from gusts and overpressures shall include the dynamic responses of the airplane structure.

3.1.2 Fratricide and enemy action. The sure-safe, mission-completion, mission-kill, and sure-kill levels of response of the airplane shall be determined for exposure to a nuclear environment generated by weapons explosion fields resulting from fratricide and enemy action. Conditions shall be as specified by the contracting activity in applicable contractual documents or as established in the conference per 3.2.

3.2 Delivery criteria and vulnerability conference. The contractor shall confer with contracting activity personnel within 45 days after authorization has been given to proceed with the airplane design, to establish specific nuclear weapons delivery criteria and vulnerability levels and applicable report preparation. At this conference the following will be established:

- a. The documents necessary for a study of nuclear weapons capability and vulnerability.
- b. Criteria for allowable and vulnerable levels of airplane structural response resulting from thermal radiation, nuclear radiation, overpressure, and material velocity or "gust" effects.
- c. Allowable and vulnerable overpressure and gust levels to which the airplane power plant may be subjected.

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- d. Allowable and vulnerable levels of thermal and nuclear radiation for the airplane crew and cockpit.
- e. The applicable airplane weights and center of gravity locations.
- f. Mission profiles.
- g. The delivery techniques or airplane flight paths and performance conditions at the delivery release point.
- h. The escape maneuvers or airplane flight paths and performance conditions from the weapon delivery release point through shock arrival at the airplane.
- i. The range of applicable environmental conditions, including such parameters as atmospheric conditions, ground albedo or reflection factors, and target elevations.
- j. The applicable surface absorptivities.
- k. The applicable airplane dynamic response factors.
- l. The degree of applicability of blast thermal interactions.
- m. Allowable and vulnerable avionics levels.
- n. The combinations of yield and burst height, the applicable weapon configurations and weapon flight trajectories, and the threat to the airplane from fratricide and enemy weapons.

3.2.1 Nuclear weapons delivery criteria report conference. Within one month after submittal of the nuclear weapons delivery criteria report required by MIL-A-8868, the contractor shall confer with personnel of the contracting activity to discuss the contents of the report.

3.3 Nuclear weapons delivery capability conference. At least 8 months prior to the delivery of the first airplane for nuclear weapons Board of Inspection and Survey (INSURV) trials, or nuclear weapons evaluation should that occur first, the contractor shall confer with contracting activity personnel to discuss the work required of the contractor for the preparation of the nuclear weapons delivery capability report. During this conference, the contracting activity will specify report format, data presentation, and emphasis to be placed on particular phases of the capability study.

3.4 Balanced hardening. Airframe design (airplane structure) shall be equal to or better than other design vulnerabilities of the airplane. The relative magnitudes of structural, crew, and avionics areas of vulnerability shall be determined. All components of the airplane shall be studied and the most vulnerable designed to be as hard as practical to achieve a level of balanced hardening acceptable to the contracting activity.

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## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification, where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of section 3. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, and does not commit the Government to accept defective material.

4.2 Methods of inspection.

4.2.1 Laboratory tests. Overpressure, thermal, and gust response limits on critical components shall be substantiated by laboratory tests as proposed by the contractor and approved by the contracting activity.

4.2.2 Analyses. Nuclear weapons effects which cannot be substantiated by laboratory tests shall be verified by analysis. The methods of analysis shall be acceptable to the contracting activity.

4.3 Design data. Structural design and analysis data shall be in accordance with MIL-A-8868.

## 5. PACKAGING

This section is not applicable to this specification.

## 6. NOTES

6.1 Intended use. The requirements of this specification are intended for use in the structural design and substantiation of airplanes.

6.2 Definitions.

6.2.1 Fratricide. Damage resulting from the effects of a nuclear weapon released by friendly forces.

6.2.2 Sure-safe. That level of response to nuclear weapon effects which permits the airplane to complete its mission and return to its home base or an alternate base in an essentially undamaged condition.

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6.2.3 Mission-completion. That level of response to nuclear weapon effects which results in the highest degree of damage the airplane can accept and still complete its mission.

6.2.4 Mission-kill. That level of response to nuclear weapon effects which assures that the airplane cannot complete its mission but does not result in the immediate destruction or loss of the airplane.

6.2.5 Sure-kill. That level of response to nuclear weapon effects which results in the immediate destruction or loss of the airplane.

6.2.6 Other terms. For definitions of other terms used in this specification see section 6 of MIL-A-8860.

6.3 Subject term (key word) listing.

Nuclear environment  
Nuclear weapons delivery  
Nuclear weapon effects requirements for airplanes

6.4 Supersession data. See supersession data in section 6 of MIL-A-8860. This specification supersedes MIL-A-8869(ASG). It also supersedes, in part, MIL-A-008869A(USAF), although MIL-A-008869A(USAF) will remain in effect until cancelled by the Air Force.

6.5 Changes from previous issue. Asterisks or vertical lines are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:  
Navy - AS

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**STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL***(See Instructions - Reverse Side)***1. DOCUMENT NUMBER**

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**2. DOCUMENT TITLE** Airplane Strength and Rigidity,  
Nuclear Weapons Effects**3a. NAME OF SUBMITTING ORGANIZATION****b. ADDRESS (Street, City, State, ZIP Code)****4. TYPE OF ORGANIZATION (Mark one)**☐

VENDOR

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USER

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MANUFACTURER

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OTHER (Specify): \_\_\_\_\_

**PROBLEM AREAS****a. Paragraph Number and Wording:****b. Recommended Wording****c. Reason/Rationale for Recommendation:****6. REMARKS****7a. NAME OF SUBMITTER (Last, First, MI) - Optional****b. WORK TELEPHONE NUMBER (Include Area Code) - Optional****c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional****8. DATE OF SUBMISSION (YYMMDD)**