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MILITARY SPECIFICATION

SAFETY REQUIREMENTS, MINIMUM, FOR AIR LAUNCHED GUIDED MISSILES

This specification is approved for use by 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 general design requirements for air launched guided missiles to minimize the hazards inherent in such a system. These requirements apply to all Navy air launched guided missile weapon systems.

2. APPLICABLE DOCUMENTS

2.1 Government documents .

2.1.1 Specifications, standards and handbook, Unless otherwise specified, the following specifications, standards and handbooks of the issue listed in that issue of the Department of Defense Index of Specification and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

L-P-406	Flammability of Plastics

MILITARY

MIL-P-5425	Plastics Sheet Acrylic, Heat Resistant
MIL-V-8712	Valve, Air Relief, Low Pressure 8 (ASG)

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, Engineering Specifications and Standards Department (Code 9311), Lakehurst, NJ 08733 by using the self-addressed stamped Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

SPECIFICATIONS

MILITARY (cont'd)

MIL-I-23659	Initiators, Electric, General Design Specification for

STANDARDS

MILITARY

MIL-STD-331	Fuze and Fuze Components; Environmental and Performance Tests for
MIL-STD-648	Design Criteria for specialized Shipping Containers
MIL-STD-882	Safety System Program Requirements
MIL-STD-1316	Fuze Design Criteria
MIL-STD-1385(NAVY)	preclusion of Ordnance Hazards in Electromagnetic Fields; General Requirements for
MIL-STD-1648	Criteria and Test Procedures for Ordnance Exposed to an Aircraft Fuel Fire
DOD-STD-2105(NAVY)	Hazard Assessment Tests for Navy Nonnuclear Ordnance

2.1.2 Other Government documents, drawings and publications. The following other Government documents, drawings and publications form a part of this specification to the extent specified herein.

MANUALS

NAVAIR AD 1115	Electromagnetic Compatibility Design Guide for Avionics and Related Ground Support Equipment.
DOD 4145.26M	DOD Contractor Safety Manual for Ammunition, Explosives and Related Dangerous Material
DOD 5154.4S	DOD Ammunition and Explosives Safety Standards
NAVAIR AS-4449	Safety Requirements for Air-Launched Guided Missile, Target Drone, Aircrew Escape, and Rocket Propulsion Systems.

MANUALS(cont'd)

NAVORD) OD 44811 Volume 1	Safety and Performance Tests for Qualification of Explosives
NAVSEA 9086-XG-STM-O 00	Naval Ship Technical Manual
Chapter 555 Volume 2	Magazine Sprinkling
Chapter 700	Shipboard Ammunition Handling and Storage
	Federal Hazardous Substance Labeling Act

(Copies of specifications, standards, handbooks, drawings and publications required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contacting officer.)

2.1.3 Order of precedences In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issue of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 568-77	Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Flexible Plastics in a Vertical Position

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

3. REQUIREMENTS

3.1 Technical effort order of preference. MIL-STD-882 as tailored by specific contract requirements will serve as a guide in conducting System Safety Analses. The technical effort to achieve safety shall be applied in the following order of preference:

3.1.1 Design for minimum hazard. Every effort shall be made, commencing in the early stages of development, to achieve inherent safety through the selection of appropriate design features and operating principles The objective is to achieve safety through simplification without jeopardizing military effectiveness.

3.1.2 Provision of safety devices or mechanisms. Certain hazards which cannot be completely eliminated shall be nullified through the provision of appropriate safety devices or mechanisms either as a part of the hazardous component or as a part of the weapon system, These Safety devices shall conform to the applicable detail requirements prescribed herein.

3.1.3 Provision of warning devices. In cases where it is imposibile through system design or through the provision of safety devices, to preclude the occurrence of a hazardous condition, suitable devices shall be provided for the detection of this hazardous situation and the generation of a warning signal.

3.1.4 Special procedures. In cases where it is impossible to eliminate certain hazards through the application of design features and where there exists special Operating procedures which, if followed, will effectively eliminate the hazards, it shall be the responsibility of the development activity to identify the hazards and to submit detailed recommendations to the Naval Air Systems Command as to the minimum procedural requirements necessary to assure safety of operation.. These detailed recommendations shall in clude any training considered necessary.

3.2 General safety considerations. An air-launched missile may be handled-by various types of personne1 and stored in depots or ships prior to its use. It will be attached to the aircraft which will subject it to launchings, in-flight environment and landings. The missile shall be safe to handle during all periods outlined herein and during its entire service life with no degradation of safety.

3.2.1 Weapon system safety. The achievement of safety in weapon systems and in individual weapon system components shall be a technical objective of the system development program and in the execution of a System Safety Program in accordance with MIL-STD-882, and the factors influencing safety shall be given full consideration during the process of system development. Weapons and equipment shall be designed to prevent the probability of personnel injuries and material damage caused by mechanical, electrical, chemical-or-explosive environments. Safety characteristics and methods shall be designed into the weapon system to provide safe arming, jettisoning, storage, shipment, handling and services use. Arming, jettisoning and premature arming preventing locks and other safety devices shall be incorporated in all weapons and launchers, and shall be easily identifiable as to their status/position. In addition, the design of the hardware or components shall preclude the potential of creating foreign object damage (FOD) as a result of handling, arming or any normal operational procedure.

3.2.2 Missile contracts and specifications. Specifications and contracts covering development of weapon systems and components, shall require-explicitly that safety be provided in accordance with the philosophy expressed in paragraph 3.2.1. Detail requirements set forth in this document, when applicable to a specific system, shall be provided for in the specifications as appropriate.

3.2.3 Maintenance mannuals. All safety information, procedures, instructions, warnings, precautions, etc., shall be included in maintenance manuals. Safety bulletins shall be issued to the forces afloat to alert them or. to emphasize new or existing hazards not included in the maintenance manuals. All safety information promulgated in this way shall be included in the maintenance manual when it is revised.

3.3 Detail design features, All safety devices and mechanisms shall be designed to assure safety during the service life of the missile.

3.3.1 Fuze safety and arming device (S&A). The primary safety device of the missile warhead shall be the fuze safety and arming device (S&A). The safety design requirements for the fuze safety and arming device shall comply with the fuze design criteria of MIL-STD-1316. This device shall also be in accordance with the System Safety Program requirements of MIL-STD-882.

3.3.1.2 Fail-safe requirement. The S&A device shall be designed to "fail-safe."

3.3.1.3 Redundancy and reliability requirements. Two arming mechanisms shall be separately employed within the S&A, each requiring an independent source of energy. One of these mechanisms shall derive its energy from an environmental condition generated after missile launch. In combination, these arming mechanisms shall have a failure rate no greater than one in one million.

3.3.1.4 Mechanical barrier requirement. The S&A explosive train shall incorporate a mechanical barrier to prevent the transfer of energy along the train should the train be initiated while the S&A is in the safe condition. Removal of this barrier shall occur automatically as a function of the arming sequence after separation of the missile from the launching aircraft and at a predetermined safe arming distance. This safe arming distance shall be based on the maximum damage radius of the warhead in the missile system.

3.3.1.5 Electrical circuit status. When the S&A is in the safe condition, the electrical circuit serving the S&A explosive initiating element shall be open.

3.3.1.6 Safe position lock requirement. Prior to the initial action to commence the arming sequence the explosive train barrier shall be positively locked in the safe position.

3.3.1.7 Indication requirement. The S&A device shall have an indicator to show its status/condition (safe or arm).

3.3.1.8 Indicator design. The design of the S&A shall incorporate a means of positively identifying the condition (safe or arm) of the device while it is assembled in the missile. Either visual inspection (access port, mechanical indicator, fiberoptic inspection instrument, etc.) or electrical monitoring is acceptable. However, if electrical monitoring is used, the monitoring circuit shall be completely isolated from all firing circuits serving the S&A and shall in no way compromise the reliability of the S&A as a means of safing the warhead.

3.3.1.9 S&A limitation requirement. The S&A device shall not function as a safing device for any other system, circuit, or electsoexplosive devices in the missile that would compromise the effectiveness of safing the warhead.

3.3.2 Propulsion system ignition The missile propulsion system igniter(s) shall meet the requirements of AS 4449 "Safety Requirements for Air Launched Guided Missiles Target, Drone, Aircrew Escape and Rocket Propulsion System."

3.3.3 Additional design considerations. As a minimum, the requirements for the safety of the missile shall provide for inherent design features for the following:

Equipments or portions of the missile -	Design considerations for safety
Edges of aerodynamic surfaces	Design protective covers during transportation or handling
Pyrotechnic device	Include means of protection for the actuating circuits
Batteries	Activation, rundown, etc.
(Gas generators	Activation, venting, etc.
Radiating source	Power, direction, activation
Fire protection.	Surface paint, etc.
Structural adequacy	Handling, carriage, launch

3.4 Missile electrical circuits. All electrical circuits which provide energy to the igniter shall be designated as hazardous circuits. These circuits shall be protected to prevent the generating of a premature ignition signal.

3.4.1 Circuit marking. Hazardous circuits shall be distinctively marked, and shall be designed and constructed to preclude them from becoming inadvertently energized when energizing any other circuit within the weapon or external thereto.

3.4.2 Protection for wiring. All sharp edges shall be removed. The edges of electrical cable accesses shall be provided with internal fillets, or rubber, fiber or plastic protection to preclude damaging the cable insulation and shielding.

3.4.3 Cable harness or assembly. Preassembled cable assemblies shall be used whenever possible, however, the number of such assemblies used must be kept to a minimum. These assemblies shall utilize proper grounding, shielding or separation in all electrical systems to minimize mutual interference. If shielded wiring is required, it must have an insulated cover over the shielding.

3.5 Electroexplosive devices (EEDs). For more detailed requirements, refer to MIL-STD-1385(navy), “Preclusion of ordnance Hazards in Electromagnetic Fields." For design considerations and guidance, NAVAIR AD 1115, “Electromagnetic Compatibility Design Guide for Avionics and Related Ground Support Equipment," shall be used MIL-I-23659, "initiators, Electric, General Design Specifications for,” be used as applicable.

3.5.1 Current rating. EEDs having a no-fire current rating less than 1 ampere shall not be used.

3.5.2 Circuit isolation requirement. The firing circuits in an EED shall be isolated front any metallic case or enclosure of the EED.

3.5.3 Barrier requirements. A continuous insulating barrier shall be provided between all parts of the firing circuits in an EED and its case. This barrier shall be of suitable plastic or other stable, inert noncontaining material having high resistivity and dielectric strength.

3.6 Warhead hazard-tests. At all times the handling of high explosives shall be governed by the basic guidelines of DOD 4145.26M. All warheads shall be subjected (at a minimum) to the safety test series of DOD-STD-2105(NAVY), “Hazards Assessment Test for Navy Nonnuclear Ordnance," and shall meet its passing criteria. When warheads are loaded with explosives not previously approved for service use, the new explosive shall be subjected (at a minimum) to the satety test series of DOD-STD-2105(NAVY) and NAVORD 0D 44811 Volume 1, "Safety and Performance Tests for Qualification of Explosives.” When qualification of a new explosive is intended (versus qualification of the warhead) the new explosive may be tested in. a container simulating the warhead. When qualification of a warhead is intended, the warhead itself must be used. A container loaded with explosives simulating the warhead shall not be used.

3.6.1 Free fall tests. Free fall tests from a height of 40 feet on a flat plate or from 10 feet onto a similar plate fitted with one inch studs shall be conducted in accordance with MIL-STD-331. The warhead shall be safe to handle and dispose of following the drop tests. . .

3.6.2 Ballistic penetration or impact requirement. The warhead shall not detonate when penetrated by a 20mm AP projectile at service velocity, or by an impact from fragments from 20mm Ap rounds or from missiles, either surface-to-air or air-to-air.

3.6.3 Temperature requirement. The warhead shall be so designed as to preclude hazards resulting from aerodynamic heating within the extremes of the temperature environment of the missile system. A specific test shall be conducted to simulate the worse case profile of the temperature expected.

3.6.4 Service life environment requirement In the design of the warhead, consideration shall be given to variations encountered, such as: submerged stowage heat from aircraft engines, sustained operation at low temperatures and effects of aging The warhead explosive material shall be insensitive to heat and incorporate insulation to delay explosive reactions which exposed to aircraft fuel fires (see MIL-STD-1648).

3.6.5 Vibration environment requirement. The equipment shall be designed to withstand any vibrations experienced in normal transportation by rail, truck, sea or air shipment as well as vibration aboard the launch aircraft. The tests shall be conducted in accordance with DOD-STD-2105(NAVY).

3.6.6 Fast cook-off tests. Fast cook-off tests shall be conducted in accordance with paragraph 5.1.5 of DOD-STD-2105(NAVY)

3.6.7 Slow cook-off tests Slow cook-off tests shall be conducted in' " . accordance with paragraph 5.1.6 of DOD-STD-2105(NAVY).

3.7 Self-destruct. Each missile shall be provided with a self-destruct capabilty unless otherwise approved by the Naval Air Systems Command.

3.8 Propulsion systems" Propulsion systems shall meet the requirements of NAVAIR AS 4449.

3.9 Missile material. "Missile materials (other than fuel,hydraulic oil, lubricants and materials used in explosive devices) shall be selected in the following order of precedence:

a. Nonflammable - Will not ignite at temperatures below 1000°F.

b. Self-extinguishing -As defined in test methods 2021 and 2022 of Federal Specification L-P-406, "Flammability of Plastics."

C. Slow-burning -Burns at a rate of 2 inches per minute or less when determined in accordance with test methods of ASTM-D 568-77, "Rate of Burning and/or Extent and Time of Burning of Flexible Plastic in Vertical Position."

3.9.1 Toxic material. Unless specifically approved by the Naval Air Systems Command, materials shall not be used which might produce harmful, toxic - effects under various conditions encountered in service, including burning or smoldering conditions.

3.9.2 Use of magnesium. The use of magnesium shall require prior approval of Naval Air Systems Command.

3.9.3 Unstable materials. Materials which become unstable and emit corrosive substances or induce corrosion within an assembly under the contemplated operating conditions, shall not be used.

3.10 Checkout. Where checkout of missiles is conducted with a solid or prepackaged liquid propellant rocket motor attached, provisions shall be made to restrain the missile against the maximum propulsion thrust which could be developed in the event the motor is inadvertently ignited, unless otherwise approved by the Naval Air Systems Command.

3.10.1 Checkout station vents. Means shall be provided. at the checkout station to vent the exhaust from an inadvertently ignited motor to the. outside atmosphere in such a manner as to minimize the danger of personnel casualties or fires within the checkout compartment.

3.10.2 Limits of continuity testing. Initiation elements shall not be tested for continuity of circuit aboard ship.

3.10.3 Limits of testing signal. Test procedures and equipment shall not generate a signal that will actuate the missile warhead fuzing assembly which would result in detonation of the warhead should the S&A mechanism be in the ARMED condition.

3.11 Missile stowage areas aboard ship. Ready service missile stowage area stanchions or missile support systems shall prevent unrestrained motion of the missile under high shock conditions or in the event of an inadvertent ignition of the missile rocket motor. The stowage of the missile shall be designed to prevent any sympathetic detonation. This requirement may be accomplished by stacking nose to tail or by the use of absorbing barrier materials (nonmetallic armor around the warhead).

3.11.1 Sprinkling system requirements. Stowage areas shall have a "wet" sprinkling systems. The design of this system shall minimize the “umbrella effect” due to missiles being stowed with their centerlines in the same vertical plane.

3.11.2 Fire fighting requirements. There shall be hand-operated fire fighting equipment available for use in the stowage area. Portable carbon dioxide, foam or gas, shall make a portion of this equipment. In the selection of such equipment, consideration shall be given to its compatibilitY with the operation of the ship, as set forth in Chapters 550 and 700 of NAVSEA 9086-XG-STM-OOO.

3.11.3 Stowage area pressure relief provisions. A stowage area design goal shall be to provide pressure relief to effectively relieve abnormal stowage area pressures (resulting from the inadvertent ignition of rocket motor) to a level that can be withstood by the stowage area bulkheads.

3.11.4 Stowage area electrical provisions. All electrical conductors and equipments except those necessary to provide service to the stowage area shall be excluded from the area

3.11.5 Static electricity control, Methods shall be employed in the stowage area to prevent the accumulation and discharge of static electricity. Missile stanchions or support systems shall permit electrical continuity from the missile to the ship structure.

3.11.6 Material restrictions. The design of the stowage area and its equipment shall eliminate the use of flammable metals. Wherever possible, designs and methods shall be employed to reduce the ignition and resulting hazards. Paints and varnishes as well as materials employed in the stowage area shall not include materials which will evolve toxic gases when subjected to high temperatures.

3.11.7 Flame tight provisions. Stowage area doors and hatches shall be flame tight. Power operated doors or hatches affording access to weapon handling elevators shall be interlocked to assure that only one door or hatch is open at any specified time.

3.11.8 Detection requirements and alarms. Safety devices shall be incorporated in the stowage area ventilation system to detect and warn personnel of hazardous gases entering the area.

3.12 Packaging containers. Packaging containers shall be designed to minimize hazards resulting from abnormal environmental and rough handling conditions.

3.12.1 Electrical continuity. Metal containers shall be designed to Assure that there is electrical continuity from the contents through the package to an outside ground.

3.12.2 Pressure relief provisions. Pressurized containers shall have a pressure relief valve. This shall relieve at a pressure differential of 5 psi and shall be in accordance with specification MIL-V-8712. This valve must release at a rate faster than any filling rate possible through the filling valve.

3.12.3 Insert gas requirement. Pressurized containers for liquid fuel rocket motors shall be pressurized with an inert gas.

3.12.4 Material restrictions. containers for ordnance items designed to be stowed on board ship shall be constructed on noncombustible materials.

3.12.5 Handling provisions - Lifting rings, eyes, lugs or handles capable of withstanding prescribed tests shall be provided for lifting loaded containers weighing over 150 pounds. Lifting eyes installed for lifting major sections of 'the container shall be located to insure a stable lifting configuration? Lifting rings shall be applied to all containers over 250 pounds; handles . shall be applied to containers from 151 pounds to 249 pounds. Lifting rings, eyes, lugs and handles shall be in accordance with MIL-STD-648.

3.12.6 Design factor of safety. General design factors of safety should not be less than five for lifting devices and three for nonlifting devices based . on the yield strength of the material used and shall be in accordance with MIL-STD-648.

3.13 Safety manuals and precautions. The safety manual which shall be provided for each weapon system shall outline the hazards and include all safety precautions and procedures relative to the missile, launcher and weapons control system. This requirement shall also apply as follows:

a. All component, subsystem, equipment and maintenance manuals shall-include pertinent safety precautions and instructions for the safe maintenance and utilization of such items and equipment. . .

b. Pilot handbooks and other operational manuals shall include pertinent safety precautions and instructions.

c. The information shall be clearly identified as a safety precaution, warning, instruction or procedure. It shall be accompanied by sketches, illustrations and photographs when necessary for clarity, emphasis and conciseness.

3.14. Workmanship. The workmanship of the design shall be checked or inspected to assure that the safety requirements specified herein shall be inherent in the missile. Verify that the missile design shall be compatible with the weapon system including its stable platforms. Also the design of the missile itself shall be simple and uncluttered and shall have fail-safe features with adequate redundancy. Reject if there is any deficiency to the above.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibilty 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.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.3)$_s$

b. Quality conformance inspection (see 4.4).

4.3 First article inspection. A first article inspection shall provide proof that the missile and its designs meet the stated requirements. However, the detail specification shall indicate when this inspection will occur and the selection of the missile. Since a first article inspection may be used for various purposes, the following table may be used as reference:

FIRST ARTICLE INSPECTION

PRODUCT	PURPOSE
Preproduction model	Producted as a hand-made toolroom model to prove design features and compatibility of its part
Pilot lots	Sample type production of limited quantity to verify manufacturing process and tooling.
Initial production samples	Start-up of full scale production. Used to de-bug the entire operation. This sample may be referenced as representing subsequent production runs.
First lots	Usually is a series of modells obtainedfrom a specific production lot or group of production lots
Test samples	Refers to a sample model from a production -run that was started after a time delay (6 months or more) or if changes are being made in the current production line.

4.4 Quality conformance inspection. Quality conformance inspection shall consist of samples obtained from a continuing production lot and is used to verify that no significant change is evidenced when the inspection or test results are compared to the first article sample. At the discretion of the Government inspector, he may reduce his level of inspection as appropriate. The detail specification will define the size of the production lot and inspection requirements thereof. Test results and inspection data may be presented in tabular form.

4.5 Inspection of packaging. Packaging shall be defined herein and in the detail specification and shall be inspected accordingly.

5. PACKAGING

5.1 Packaging requirements. The requirements for packing shall be in accordance with paragraph 3.12 and the detail specification which shall define the exterior shipping container assembly of items or packs, preservation, marking for shipment, etc.

5.2 Marking. Marking of the missile shall be in accordance with the detail specification and related drawings, which shall include appropriate Federal status and regulations e.g., Federal Hazardous Substance Labeling Act and DoD Manual 5154.4s. In addition, the detail specification may require markings to define type and date of manufacture, source. or production lot.

6. NOTES

6.1 Intended use. The safety requirements herein shall render the missile harmless under normal and adverse conditions when manufactured, stored, handled, or in-flight, and shall provide safegaurds after launch from its aircraft.

6.2 Definitions. The following standardized terminology, definitions and abbreviations are applicable to the requirements herein. - Additional definitions pertaining to explosives shall be as noted in MIL-STD-1648(AS).

6.2.1 Safety and arming device (S&A) A mechanism which prevents or allows to warhead train of explosive to operate. Specifically", a mechanism, interposed between the missile fuze and the warhead or exercise head, which maintains the fuzing system in a nonfiring state throughout the logistic cycle and apretetermined arming sequence has occured. The safety and arming device is a component of the missile fuzing system. To avoid confusion, the terms "safety and arming device" or "S&A" shall not be used witih referene to the safety mechanism associated with the propulsion system (see paragraph 3.3.2).

6.2.2 Fail-safe. "Descriptive of fuze design features whereby a component failure prevents the fuze from functioning. As applied to ordance "systems in general: the fail-safe principle requires that component failure shall not create an undue hazard to personnel or equipment even though this requirement must be met at the expense of system operability.

6.2.3 Hazardous circuits. Circuits which, if accidentally energized, could cause an explosion or fire of an extent great enough to-cause injury to personnel or damage to equipment on installations.

6.2.4 Electroexplosive device (EED) An electric initiator together with any

other explosive and mechanical components which are procured as an integral unit sealed against disassembly.

6.2.5 No-fire current rating. The direct current sensitivity of an EED based on a specified threshold probability of initiation. This probability is set at various values depending on the consequences of spurious initiation and other considerations. Often it is taken as 4 standard deviations below the 50% probability value, as estimated from best available statistical data.

6.2.6 Detonate. To be changed by exothermic chemical reaction usually from a solid or liquid to a gas with such rapidity that the rate of advance of the reaction zone into the unreacted material exceeds the velocity of sound in the unreacted material; that is, the advancing reaction zone is preceded by a shock wave.

6.2.7 Deflagrate. To burn rapidly (it is generally implied that burning is with self-contained oxygen) so that the reaction zone advances into the unreached material at less than the velocity of sound in the unreacted material.

6.2.8 Solid particles. Solid particles harmful to aircraft are defined as solid materials emitted from the thrust unit exhaust which either: (a) are over 1/32 inch in any dimension and over 0.5 grams in weight or (b) will cause over fifty pits per square foot on a flat acrylic sheet (complying with MIL-P-5424, “Plastic, Sheet Acrylic, Heat Resistant") with the base at a distance of thirty feet from the nozzle exit and supported at an angle of 60° with the horizontal.

6.2.9 "Wet sprinkling system. A system which contains water under pressure ready for use at the sprinkling heads as opposed to a "dry" system which does not contain water beyond the main regulating valve until activated.

6.2.10 Umbrella effect. The shielding effect of motors or missiles which are physically located between the sprinkling heads and other units stowed in the same compartment. The units so shielded do not receive the full protective effects of the water in the event of fire or accidental initiation of an ordinance component.

6.3 NOTICE. “When the Government drawings, specifications or other data are used for any purpose other than in connection with a definitely related Government acquisition operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto*

6.4 Changes from previous issue. Asterisks 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
(Project No. 1410-NIO4)

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NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*:

5. 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)*

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