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NFPA 1122 Unmanned Rockets 1987 Edition

National Fire Protection Association Batterymarch Park, Quincy, MA 02269

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Policy Adopted by NFPA Board of Directors on December 3, 1982

The Board of Directors reaffirms that the National Fire Protection Association recognizes that the toxicity of the products of combustion is an important factor in the loss of life from fire. NFPA has dealt with that subject in its technical committee documents for many years.

There is a concern that the growing use of synthetic materials may produce more or additional toxic products of combustion in a fire environment. The Board has, therefore, asked all NFPA technical committees to review the documents for which they are responsible to be sure that the documents respond to this current concern. To assist the committees in meeting this request, the Board has appointed an advisory committee to provide specific guidance to the technical committees on questions relating to assessing the hazards of the products of combustion.

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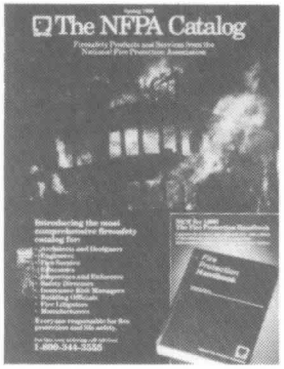

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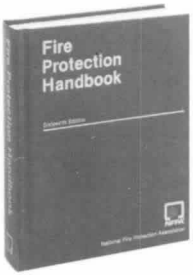

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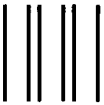

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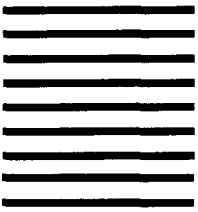

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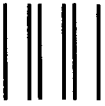

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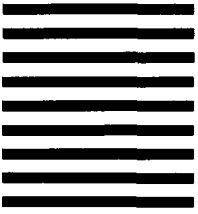

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NFPA 1122

Code for Unmanned Rockets

1987 Edition

This edition of NFPA 1122, *Code for Unmanned Rockets*, was prepared by the Technical Committee on Pyrotechnics, and acted on by the National Fire Protection Association, Inc. at its Fall Meeting held November 17-20, 1986, in Denver, Colorado. It was issued by the Standards Council on December 10, 1986, with an effective date of December 30, 1986, and supersedes all previous editions.

The 1987 edition of this standard has been approved by the American National Standards Institute.

Changes other than editorial are indicated by a vertical rule in the margin of the pages on which they appear. These lines are included as an aid to the user in identifying changes from the previous edition.

Origin and Development of NFPA 1122

NFPA 1122 was originally prepared as a tentative code by the Committee on Pyrotechnics under the designation NFPA 41L, *Code for Model Rocketry*. It was tentatively adopted in 1967 and officially adopted by the Association in May, 1968. In November, 1976, a major revision of NFPA 41L, including its new designation as NFPA 1122L, *Code for Unmanned Rockets*, was adopted. The 1976 edition was again revised by the Committee on Pyrotechnics in 1980 to delete the "L" designation and to delete the requirements for cold propellant rocket motors, which are no longer allowed. Other technical changes were made at this time. These revisions were adopted at the 1981 NFPA Fall Meeting and the consequent document was designated the 1982 edition.

The Committee made amendments to the 1982 edition and processed the amendments at the 1986 NFPA Fall Meeting, resulting in this 1987 edition.

Committee on Pyrotechnics

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Phoenix, AZ
Rep. Nat'l. Assn. of Rocketry

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Nonvoting

Donald F. McCaulley, Consumer Product Safety Comm.

This list represents the membership at the time the Committee was balloted on the text of this edition. Since that time, changes in the membership may have occurred.

NOTE: Membership on a Committee shall not in and of itself constitute an endorsement of the Association or any document developed by the Committee on which the member serves.

Contents

Foreword

The purposes of this code are to prohibit the making and launching of dangerous homemade "rocket bombs" and to eliminate the tragic injuries and deaths that have occurred because of experiments with explosive "rocket fuels," homemade rocket motors, and unsafe launching mechanisms.

The code contains instructional guidelines and specific standards for the design, construction, limitation of charge and power, and reliability of all rocket motors manufactured for sale to the general public; for the design and construction of rockets propelled by these motors; and for the conduct of tests, launchings, and other operations involving such rockets so that hazards are minimized.

The NFPA Committee on Pyrotechnics feels that this code contains appropriate measures to safeguard this popular and growing activity. These safe model rocket activities should not be confused with the hazardous, uncontrolled operations of so-called basement bombers and amateur rocketeers who attempt to make their own propellants, rocket motors, and large metallic rocket vehicles. Model rocket activities should be allowed within the specifications of this code to safely guide our science-minded youth and citizens.

NFPA 1122

Code for Unmanned Rockets

1987 Edition

Chapter 1 General Requirements

1-1 Scope.

1-1.1 This code shall apply to the design, construction, limitation of propellant mass and power, and reliability of all rocket motors, other than fireworks rockets, produced commercially for sale to and/or use by the public for purposes of education, recreation, and sporting competition.

1-1.2 This code shall also apply to the design and construction of rocket vehicles propelled by the rocket motors specified in 1-1.1.

1-1.3 This code shall also apply to the conduct of launch operations of the rocket vehicles specified in 1-1.2.

1-1.4 This code shall not apply to the design, construction, production, manufacture, fabrication, maintenance, launching, flight, test, operation, use, or other activity in connection with a rocket or rocket motor when carried out or engaged in by:

(a) the government of the United States of America;

(b) any state or local government;

(c) any individual, firm, partnership, joint venture, corporation, or other business entity engaged, as a licensed business, in research, development, production, testing, maintenance, or supply of rockets, rocket motors, rocket propellant chemicals, or rocket components or parts; or

(d) any college or university.

1-1.5 This code shall not apply to the design, construction, fabrication, production, manufacture, maintenance, launching, flight, test, operation, or use of rocket-propelled model aircraft that sustain their mass against the force of gravity by aerodynamic lifting surfaces that support the aircraft during the entire duration of their flight in the air or to the rocket motors that provide the propulsion for such model aircraft.

1-1.6 This code shall not apply to model or toy rockets propelled by pressurized liquid rocket motors containing less than 250 ml (8.45 liquid oz) of water.

1-1.7 This code shall not apply to skyrockets, or rockets with sticks, (or other fireworks rockets) as defined in Section 1-3.

1-2 Purpose.

1-2.1 The purpose of this code shall be to ensure the wide and easy availability of commercial model rocket motors that meet standards of safety and reliability, thereby ensuring that the creative and experimental urges of the public regarding rocket devices has reasonably safe outlets.

1-2.2 The purpose of this code shall also be to discourage the making and launching of homemade rockets and other rocketlike vehicles propelled or intended to be propelled by homemade rocket propulsion devices.

1-2.3 The purpose of this code shall also be to discourage experiments with explosive or highly energetic rocket propellants, construction of homemade rocket propulsion motors, and attempted launchings or operations of these homemade rocket devices, thereby minimizing tragic deaths and injuries.

1-3 Definitions. For the purposes of this code, the following terms shall be defined as stated in this section.

Aero model. A miniature, unmanned replica of a flying device, which includes the category of model rocket, as defined in 1-3.

Approved. Acceptable to the "authority having jurisdiction."

NOTE: The National Fire Protection Association does not approve, inspect or certify any installations, procedures, equipment, or materials nor does it approve or evaluate testing laboratories. In determining the acceptability of installations or procedures, equipment or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization concerned with product evaluations which is in a position to determine compliance with appropriate standards for the current production of listed items.

Authority having jurisdiction. The "authority having jurisdiction" is the organization, office or individual responsible for "approving" equipment, an installation or a procedure.

NOTE: The phrase "authority having jurisdiction" is used in NFPA documents in a broad manner since jurisdictions and "approval" agencies vary as do their responsibilities. Where public safety is primary, the "authority having jurisdiction" may be a federal, state, local or other regional department or individual such as a fire chief, fire marshal, chief of a fire prevention bureau, labor department, health department, building official, electrical inspector, or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the "authority having jurisdiction." In many circumstances the property owner or his designated agent assumes the role of the "authority having jurisdiction"; at government installations, the commanding officer or departmental official may be the "authority having jurisdiction."

Cold propellant rocket motor. A rocket motor that produces force or thrust by change of state of the substance contained, i.e., not by a process involving combustion.

Hybrid rocket motor. A rocket motor in which the fuel is in a different physical state (solid, liquid, or gaseous) than the oxidizer and that derives its force or thrust from the combination thereof.

Labeled. Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Liquid propellant rocket motor. A rocket motor that contains a fuel and an oxidizer in liquid form or in a combined monopropellant liquid form as a single chemical and that derives its force or thrust from the combustion thereof.

Listed. Equipment or materials included in a list published by an organization acceptable to the "authority having jurisdiction" and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

NOTE: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. The "authority having jurisdiction" should utilize the system employed by the listing organization to identify a listed product.

Model rocket. A rocket that is propelled by a model rocket motor; that contains a device for returning it to the ground in a condition to fly again; whose structural parts are made of paper, wood, or breakable plastic and containing no substantial metal parts, except cold propellant rocket motors; and whose primary use is for purposes of education, recreation, and sporting competition.

Model rocket motor. A solid propellant, cold propellant, or pressurized liquid rocket motor that conforms to the standards for rocket motors as set forth in this code.

Pressurized liquid rocket motor. A rocket motor that derives its force or thrust from a liquid expelled from the rocket motor by pressurized gas and involving no combustion or change of state.

Production lot. A quantity of solid propellant rocket motors produced during a single work shift, on the same motor manufacturing device, using the same batch of propellant material.

Rocket. A device that ascends into the air without use of aerodynamic lifting forces acting against gravity and that is propelled by a rocket motor.

Rocket engine. (*See definition of rocket motor.*)

Rocket motor. A device, or combination of devices, that provides the necessary force or thrust to cause a rocket to move. The force or thrust shall be created by the discharge of gas generated by combustion, decomposition, change of state, or other operation of materials contained, carried, or stored solely within said rocket motor or rocket and not dependent upon the outside environment for reaction mass.

Rocket vehicle. (*See definition of rocket.*)

Shall. Indicates a mandatory requirement.

Should. Indicates a recommendation or that which is advised but not required.

Skyrocket or rockets with sticks. Commercially manufactured fireworks rockets not intended for reuse and which have been classified as Class B or Class C fireworks in accordance with U.S. Department of Transportation regulations.[1]

Solid propellant rocket motor. A rocket motor containing a fuel and an oxidizer in solid form and deriving its force or thrust from the combustion thereof.

Steam rocket motor. A rocket motor that produces its force or thrust by means of steam carried or stored within the rocket motor or rocket vehicle or produced in the rocket motor or rocket vehicle by the heating of water therein.

Thrust augmenter. A device for increasing the force or motive power of a rocket motor by imparting a portion of the momentum of the rocket motor's exhaust jet to the surrounding environmental medium, and is considered to be part of a rocket motor when and where used.

Chapter 2 Requirements for Rocket Construction and Operation

2-1 A rocket shall at all times comply with the requirements of construction and operation as set forth in Section 307, 72 Statute 749, 49 *U.S. Code* 1348, "Airspace Control and Facilities"; Federal Aviation Act of 1958 covering *Federal Aviation Regulations*, Part 101, Subpart A, pp. 101.1, (a)(3)(ii)(a) through (d), or later revisions or amendments thereto. (*See Appendix A.*)

Chapter 3 Requirements for Model Rocket Motors

3-1 Solid Propellant Rocket Motors.

3-1.1 A solid propellant rocket motor shall be a device produced by a commercial manufacturer and shall have all of the propellant preloaded into the motor casing in such a manner that the propellant cannot be removed without destroying the motor. Delay trains and ejection charges may be included as an integral part of the motor or may be preloaded and packaged separately if (a) the

[1]The Department of Transportation regulations referred to are designated *Code of Federal Regulations*, Title 49, Part 173.

auxiliary package is a single preassembled unit containing all of the remaining combustible material, and (b) the auxiliary package is so designed that an individual would have no difficulty handling and using it safely.

3-1.2 A solid propellant rocket motor casing shall be made of nonmetallic material of low thermal conductivity such that the temperature of the external surface of the motor casing cannot exceed 200°C (392°F) during or after operation.

3-1.3 A solid propellant motor casing shall be so designed and constructed that it will not fragment if it should rupture.

3-1.4 A solid propellant rocket motor shall be so designed and constructed as to be incapable of spontaneous ignition in air, in water, or as a result of physical shocks, jarring, impacts, or motion under conditions that would reasonably be expected to occur during shipment, storage, and use, or when subjected to a temperature of 80°C (176°F) or less.

3-1.5 A solid propellant rocket motor shall contain not more than 62.5 grams (2.2 oz) of propellant materials and shall produce 160 Newton-seconds (N-sec) (35.955 pound-seconds) or less of total impulse with a thrust duration no less than that set forth in the table below:

Total Impulse (N-sec)	Minimum Duration (seconds)
0.00 – 10.00	0.05
10.01 – 20.00	0.25
20.01 – 40.00	0.50
40.01 – 80.00	1.00
80.01 – 160.0	1.60

3-1.6 A manufacturer of solid propellant rocket motors shall subject a random sample of 1 percent of each motor production lot to a static test which shall measure and record the rocket motor's total impulse, delay time, and action of ejection charge, if included. Solid propellant rocket motor production lots shall be corrected, destroyed or retested by the manufacturer under any of the following conditions:

(a) the total impulse of any test item departs more than 20 percent from the established mean total impulse value of the rocket motor type;

(b) the time delay of any test item departs more than 20 percent from the established mean time delay value of the rocket motor type, but in no case shall this variation exceed 3 seconds;

(c) the ejection charge, if any, of any test item does not function properly;

(d) any test item malfunctions in any other manner that affects the safety of its shipment, storage, handling, or use. Static tests shall be conducted with the test items at ambient temperature.

For a retest, a manufacturer shall test a minimum additional 2 percent of the production lot in question. If any additional test item displays any of the abovementioned conditions, the entire production lot shall be corrected or destroyed by the manufacturer.

3-1.7 A solid propellant rocket motor type whose performance deviates from the sample test criteria and performance limits detailed above within 1 year from the date of manufacture shall be withdrawn from commercial sale and redesigned to provide reliable operation when ignited within a period of 1 year from the date of manufacture. All solid propellant rocket motors shall have imprinted upon the exterior surface of their motor casing the date of manufacture or equivalent coding.

3-1.8 A solid propellant rocket motor shall be shipped and stored with no ignition element installed that can be activated by an open flame at a temperature of less than 150°C (302°F), or by incident radio frequency radiation normally encountered in shipping, storage, handling, or use.

3-1.9 No manufacturer, distributor, or other person shall sell, offer to sell, expose for sale, or otherwise make available to the public any type of rocket motor ignition device that is intended to be initiated by a hand-held flame.

3-1.10 A solid propellant rocket motor shall be shipped and sold with complete instructions for its storage, handling, and use. These instructions shall contain a warning to read and follow all instructions carefully and to use the rocket motor only in accordance with instructions. In addition, the instructions shall contain the following information:

(a) how to safely ignite the rocket motor by electrical means;

(b) performance data on the rocket motor type to include propellant weight, total impulse, average thrust, time delay, and representative thrust-time curve;

(c) any special first aid data or action to be taken in the event of burns or oral ingestion of the propellant;

(d) proper and safe disposal of the rocket motor if it has become too old, been subjected to conditions that may impair its performance or, in the opinion of the user, may have become unsafe;

(e) any special action that must be taken to fight any fire in which stored rocket motors may be involved.

3-2 Pressurized Liquid Rocket Motors.

3-2.1 A pressurized liquid rocket motor shall be sold as a completely prefabricated, assembled device ready for the user to fill, pressurize, and use.

3-2.2 A pressurized liquid rocket motor shall use water in the liquid state or other nontoxic liquid as a propellant or reaction mass.

3-2.3 A pressurized liquid rocket motor shall be designed for an internal working pressure not greater than 7 atmospheres gage (103 psig or 7.231 kg per cm^2) and shall be equipped with a nonadjustable, nonremovable safety valve or pressure release means that will operate when the internal pressure exceeds 10 atmospheres gage (147 psig or 10.33 kg per cm^2). The pressurized liquid rocket motor casing shall be designed and constructed to possess a minimum burst pressure of 20 atmospheres gage (294 psig or 20.66 kg per cm^2).

3-2.4 A pressurized liquid rocket motor shall be shipped and stored with no propellant material inside it and vented to atmospheric pressure.

3-2.5 The pressure used by a pressurized liquid rocket motor shall be either generated or produced by a pressure source such as a pump outside the rocket motor or generated by the noncombustible chemical reaction of chemicals within the rocket motor or rocket vehicle.

3-2.6 Materials used in the construction or fabrication of a pressurized liquid rocket motor shall be nonmetallic.

Chapter 4 Testing and Certification

4-1 Model rocket motor types offered for sale, exposed for sale, sold, used, or made available to the public shall be examined and tested by the authority having jurisdiction to determine whether or not they comply with the standards and requirements detailed in Chapter 3. The authority having jurisdiction shall certify as acceptable for sale and use those products that do comply. At the discretion of the authority having jurisdiction, such examination, testing, and certification may be carried out by an approved testing laboratory or an organization such as the National Association of Rocketry or its successor organization affiliated with the National Aeronautic Association (the national aeronautical club of the United States of America having jurisdiction over the sporting and competitive aspects of model rocketry as the United States representative to the Federation Aeronautique Internationale).

4-2 The authority having jurisdiction shall maintain a current and complete list of all those rocket motor types that are certified as complying with the standards and requirements detailed in Chapter 3 and shall make copies of this list available to citizens and public safety officials requesting it.

Chapter 5 Prohibited Activities and Permit Requirements

5-1 Prohibited Activities. The following activities shall be prohibited by this code:

5-1.1 The use of rocket motors for the primary purpose of producing a spectacular display of color, light, sound, or any combination thereof.

Exception: This prohibition shall not be construed as prohibiting the public demonstration of model rockets as defined herein and as certified according to these regulations.

5-1.2 The use of a rocket or rocket motor as a weapon against a target.

5-1.3 The use of a rocket motor contrary to the instructions for its use and contrary to the provisions of *Federal Aviation Regulations* Part 101.1(a)(3)(ii).

5-1.4 Tampering with any rocket motor in any manner or degree that is contrary to the purpose for which said rocket motor is designed and intended to be used.

5-1.5 The sale, offering for sale, exposing for sale, or otherwise making available to the public any rocket motor that does not comply with the requirements herein and has not been certified in accordance with Chapter 4 herein.

5-1.6 The operation, discharge, or activation of a rocket motor contrary to the provisions of *Federal Aviation Regulations*.

5-1.7 The manufacture, production, fabrication, making, operation, maintenance, launch, flight, test, activation, discharge, or other experimentation with rockets or rocket motors that have not been certified in accordance with the provisions of Chapter 4 including, but not limited to, cold propellant rocket motors, hybrid rocket motors, liquid propellant rocket motors, steam rocket motors, and rocket propellant chemicals for solid, liquid, and hybrid rocket motors including monopropellants.

5-1.8 The sale, offering for sale, exposing for sale, making, or using of fuse, wick, or other ignition devices intended to be activated by a hand-held flame for the purpose of starting or igniting a rocket motor.

5-1.9 Affixing to a rocket motor a statement of compliance with the regulations or statement of certification required by Chapter 4, or statements in writing in advertising or on the package that certification according to Chapter 4 has been obtained when such certification has not been obtained, has been withdrawn, or has been denied.

5-1.10 Reloading any solid propellant rocket motor with any material, once said motor has been operated.

5-1.11 Reloading, refilling, or pressurizing any pressurized liquid rocket motor with any material or by any means not specifically provided or recommended by the manufacturer.

5-2 User Permits. A permit shall be required for the storage by a user of more than 100 kg (220 lb) of solid propellant model rocket motors. No other permit shall be required of a user (e.g., possession, use, purchase, transportation, or sale of model rocket motors).

Chapter 6 Referenced Publications

6-1 The following documents or portions thereof are referenced within this document and shall be considered part of the requirements of this document. The edition indicated for each reference shall be the current edition

as of the date of the NFPA issuance of this document. These references shall be listed separately to facilitate updating to the latest edition by the user.

6-1.1 NAR Publication. National Association of Rocketry, 182 Madison Drive, Elizabeth, PA 15037.

Model Rocket Safety Code of the National Association of Rocketry - Hobby Industry Association of America, 1982.

6-1.2 U.S. Government Publications. U.S. Government Printing Office, Washington, D.C.

Code of Federal Regulations, Title 49, Transportation, Part 173.

Federal Aviation Regulations, Part 101, Subpart A, Part 101.1(a)(3)(ii).

United States Code 1348, 72 Statute 749, Section 307, "Airspace Control and Facilities."

Appendix A Supplementary Information

This Appendix is not a part of the requirements of this NFPA document, but is included for information purposes only

A-1 Excerpt from Section 307, 72 Statute 749, 49 *United States Code* 1348, "Airspace Control and Facilities"; Federal Aviation Act of 1958 covering *Federal Aviation Regulations*, Part 101, Subpart A, Part 101.1(a)(3)(ii):

The Part prescribes rules governing the operation in the United States of the following: . . .

(3)Any unmanned rocket except . . .
- (ii) Model rockets
  - (a) Using not more than four ounces of propellant;
  - (b) Using a slow-burning propellant;
  - (c) Made of paper, wood, or breakable plastic, containing no substantial metal parts, and weighing not more than 16 ounces, including the propellant; and
  - (d) Operated in a manner that does not create a hazard to persons, property, or other aircraft.

A-2 Model Rocket Safety Code of the National Association of Rocketry - Hobby Industry Association of America.

1. Construction. My model rockets will be made of lightweight materials such as paper, wood, rubber, and plastic without any metal or other hazardous material as structural parts.

2. Engines. I will use only pre-loaded factory-made NAR safety-certified rocket engines in the manner recommended by the manufacturer. I will not alter or dismantle model rocket engines or their ingredients in any way, or attempt to reload these engines.

3. Recovery. I will always use a recovery system in my model rockets that will return them safely to the ground so that they may be flown again. I will use only flame resistant recovery wadding in my rockets.

4. Weight Limits. My model rockets will weigh no more than 1500 grams (53 oz) at liftoff and the engines will contain a total of no more than 125 grams (4.4 oz) of propellant. My model rockets will weigh less than the engine manufacturer's recommended maximum liftoff weight for the engines used, or I will use engines recommended by the manufacturer for my rockets.

5. Stability. I will check the stability of my model rockets before their first flight, except when launching models of already proven stability.

6. Payloads. My model rockets will never carry live animals, or payloads that are intended to be flammable or explosive.

7. Launch Area. I will launch model rockets outdoors in a cleared area, free of tall trees, power lines, and buildings. I will ensure that people in the launch area are aware of the pending rocket launch and are in a position to see the rocket's liftoff before I begin my audible five-second count down.

8. Launcher. I will launch my model rockets from a launch rod or other device that provides rigid guidance until the rocket has reached a speed adequate to ensure a safe flight path. To prevent accidental eye injury, I will always place the launcher so that the end of the rod is above eye level or will cap the end of the rod when approaching it. I will cap or disassemble my launch rod when not in use and will never store it in an upright position. My launcher will have a jet deflector device to prevent the engine exhaust from hitting the ground directly. I will always clear the area around my launch device of brown grass, dry weeds, and other easy-to-burn materials.

9. Ignition System. The system I use to launch my model rockets will be remotely controlled and electrically operated, and will contain a launching switch that will return to "off" when released. The system will contain a removeable safety interlock in series with the launching switch. All persons will remain at least 15 ft from the model rocket when I am igniting engines totalling 30 N-sec or less of total impulse and at least 30 ft from the model rocket when I am igniting engines totalling more than 30 N-sec total impulse. I will use only electrical igniters that will ignite my rocket engine(s) within one second of actuation of the launching switch.

10. Launch Safety. I will not let anyone approach a model rocket on a launcher until I have made sure that the safety interlock has been removed or the battery has been disconnected from the ignition system. In the event of a misfire I will wait one minute before allowing anyone to approach the launcher.

11. Flying Conditions. I will launch my model rocket only when the wind is less than 20 miles per hour and under conditions where the model will not fly into clouds,

fly near aircraft in flight, or be hazardous to people or property.

12. Pre-Launch Test. When conducting research activities with unproven designs or methods I will, when possible, determine their reliability through pre-launch tests. I will conduct launchings of unproven designs in complete isolation from persons not participating in the actual launching.

13. Launch Angle. I will not launch model rockets so that their flight path will carry them against targets. My launch device will be pointed within 30 degrees of vertical. I will never use model rocket engines to propel any device horizontally.

14. Recovery Hazards. If a model rocket becomes entangled in a power line or other dangerous place, I will not attempt to retrieve it.

A-3 Suggested Launch Site Dimensions and Provisions.

NOTE: These launching site dimensions and provisions are included as an Appendix to NFPA 1122-1987 to provide the authority having jurisdiction and the interested public with a guideline concerning recommended, but not required, conditions for flying model rockets of the type permitted by these regulations.

Launch Site Dimensions

Motor Type	Total Impulse (N-sec)	Minimum Site Dimensions (feet)
1/4A & 1/2A	0 — 1.25	50
A	1.26 — 2.50	100
B	2.51 — 5.00	200
C	5.01 — 10.00	400
D	10.01 — 20.00	500
E	20.01 — 40.00	1000
F	40.01 — 80.00	1000
G	80.01 — 160.00	1000

For SI Units: 1 ft = 0.3 m

A-3.1 Launch Times. Models should be launched only during hours of daylight.

A-3.2 Recovery Wadding. The recovery device protective material (wadding), ejected from the model during the flight sequence when the recovery device is deployed, should be of a flame resistant material.

A-3.3 Launch Site Conditions. The area for a radius of 5 ft (1.5 m) around the launching device should be clear of dry grass or other flammable substances. It is recommended that the launch device be set atop a flame resistant tarpaulin or canvas sheet if the launch area is grass-covered. The launch site should not be located in a grain field or forested land.

Index

Tentative Interim Amendment

NFPA 1122

Code for Unmanned Rockets

1987 Edition

Reference: 3-1.3, 3-1.5, 5-1.5
T.I.A. 87-1

Pursuant to Section 15 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 1122, *Code for Unmanned Rockets,* 1987 edition. The TIA was processed by the Committee on Pyrotechnics and was issued by the Standards Council on May 19, 1989.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a Proposal of the proponent for the next edition of the standard; as such, it then is subject to all of the procedures of the standards making process.

1. Revise 3-1.3 to read:

"A solid propellant model rocket motor shall be so designed that, if it should rupture, it will not project any casing fragments beyond a radial distance of 10 feet for motors of less than 30 newton-seconds total impulse, or 20 feet for motors equal to or greater than 30 newton-seconds."

2. Replace "Minimum Burntime Table" (3-1.5) with the statement:

"All model rocket motors shall produce an average thrust of 80 newtons or less when tested by the National Association of Rocketry or other organization acceptable to the authority having jurisdiction."

3. Revise 5-1.5 to read:

"The sale or transfer to the general public, not otherwise exempt in 1-1.4 of this code, of any rocket motor that has not been certified in accordance with Chapter 4 herein."

Issue Date: May 1989

Tentative Interim Amendment

NFPA 1122

Code for Unmanned Rockets

1987 Edition

Reference: 3-1.5*, A-3-1.5, 6-1.2
T.I.A. 87-2

Pursuant to Section 15 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 1122, *Code for Unmanned Rockets*, 1987 edition. The TIA was processed by the Committee on Pyrotechnics and was issued by the Standards Council on October 2, 1992.

A Tentative Interim Amendment is tentative because it has not been processed through the entire standards-making procedures. It is interim because it is effective only between editions of the standard. A TIA automatically becomes a Proposal of the proponent for the next edition of the standard; as such it then is subject to all of the procedures of the standards-making process.

1. Revise the wording of 3-1.5 to read:*

3-1.5* A solid propellant rocket motor shall contain no more than 62.5 grams (2.2 oz) of propellant materials and shall produce a total impulse not in excess of federal regulations as set forth in 16 CFR Section 1500.85 (a)(8)(ii). A model rocket motor shall produce an average thrust of 80 Newtons or less when tested by an organization acceptable to the authority having jurisdiction.

2. Add A-3-1.5 to read:

A-3-1.5 U.S Consumer Product Safety Commission (CPSC) regulations (16 CFR Part 1500.85) limit total impulse to less than 80 Newton-seconds (17.92 pound-seconds) of total impulse with thrust duration not less than 0.050 seconds.

3. Add a reference in 6-1.2 to include:

Code of Federal Regulations, Title 16, Part 1500, January 1, 1990 edition.

CHARLES S. MORGAN ESQ.
NATIONAL FIRE PROTECTION ASSOCIATION
1 BATTERYMARCH PARK
QUINCY, MA 02269-9101

Tentative Interim Amendment

NFPA 1122

Code for Unmanned Rockets

1987 Edition

Reference: 3-1.5*, A-3-1.5, 6-1.2
T.I.A. 87-2

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1. Revise the wording of 3-1.5* to read:

"3-1.5* A solid propellant rocket motor shall contain no more than 62.5 (2.2 oz) of propellant materials and shall produce a total impulse not in excess of federal regulations as set forth in 16 CFR Section 1500.85 (a) (8) (ii).
A model rocket motor shall produce an average thrust of 80 newtons or less when tested by an organization acceptable to the authority having jurisdiction."

2. Add Appendix text A-3-1.5 to read:

"A-3-1.5 U.S Consumer Product Safety Commission (CPSC) regulations (16 CFR Part 1500.85) limit total impulse to less than 80 newton-seconds (17.92 pound seconds) of total impulse with thrust duration not less than 0.050 seconds."

3. Add a reference in 6-1.2 to include:

"Code for Federal Regulations, Title 16, Part 1500, January 1, 1990 Edition"

Reason: The revision to the first sentence is necessary to bring NFPA 1122-1987 into agreement with the regulations of the United States Consumer Product Safety Commission. The second sentence incorporates the amendment of TIA 87-1. The appendix text gives the recommendation for specific thrust limitations. The reference is added to include appropriate federal regulations.

SUBMITTING PROPOSALS ON NFPA TECHNICAL COMMITTEE DOCUMENTS

Contact NFPA Standards Administration for final date for receipt of proposals on a specific document.

INSTRUCTIONS

Please use the forms which follow for submitting proposed amendments. Use a separate form for each proposal.

1. For each document on which you are proposing amendment indicate:
   (a) The number and title of the document
   (b) The specific section or paragraph.

2. Check the box indicating whether or not this proposal recommends new text, revised text, or to delete text.

3. In the space identified as "Proposal" include the wording you propose as new or revised text, or indicate if you wish to delete text.

4. In the space titled "Statement of Problem and Substantiation for Proposal" state the problem which will be resolved by your recommendation and give the specific reason for your proposal including copies of tests, research papers, fire experience, etc. If a statement is more than 200 words in length, the technical committee is authorized to abstract it for the Technical Committee Report.

5. Check the box indicating whether or not this proposal is original material, and if it is not, indicate source.

6. If supplementary material (photographs, diagrams, reports, etc.) is included, you may be required to submit sufficient copies for all members and alternates of the technical committee.

NOTE: The NFPA Regulations Governing Committee Projects in Paragraph 10-10 state: Each proposal shall be submitted to the Council Secretary and shall include:

(a) identification of the submitter and his affiliation (Committee, organization, company) where appropriate, and

(b) identification of the document, paragraph of the document to which the proposal is directed, and

(c) a statement of the problem and substantiation for the proposal, and

(d) proposed text of proposal, including the wording to be added, revised (and how revised), or deleted.

FORM FOR PROPOSALS ON NFPA TECHNICAL COMMITTEE DOCUMENTS

Mail to: Secretary, Standards Council
National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269

Date 5/18/85 **Name** John B. Smith **Tel. No.** 617-555-1212

Address 9 Seattle St., Seattle, WA 02255

Representing (Please indicate organization, company or self) Fire Marshals Assn. of North America

1. a) **Document Title:** Protective Signaling Systems **NFPA No. & Year** NFPA 72D

   b) **Section/Paragraph:** 2-7.1 (Exception)

2. **Proposal recommends: (Check one)** ☐ new text
   ☐ revised text
   ☒ deleted text.

3. **Proposal (include proposed new or revised wording, or identification of wording to be deleted):**

   Delete exception.

4. **Statement of Problem and Substantiation for Proposal:**

   A properly installed and maintained system should be free of ground faults. The occurrence of one or more ground faults should be required to cause a "trouble" signal because it indicates a condition that could contribute to future malfunction of the system. Ground fault protection has been widely available on these systems for years and its cost is negligible. Requiring it on all systems will promote better installations, maintenance and reliability.

5. ☒ **This Proposal is original material.**
   ☐ **This Proposal is not original material; its source (if known) is as follows:** _____

(Note: Original material is considered to be the submitter's own idea based on or as a result of his own experience, thought, or research and, to the best of his knowledge, is not copied from another source.)

I agree to give NFPA all and full rights, including rights of copyright, in this Proposal and I understand that I acquire no rights in any publication of NFPA in which this Proposal in this or another similar or analogous form is used.

John B. Smith

Signature

PLEASE USE SEPARATE FORM FOR EACH PROPOSAL