1127

NFPA 1127 Code for High Power Rocketry 1995 Edition

National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101
An International Standards-Making Organization

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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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NFPA 1127

Code for

High Power Rocketry

1995 Edition

This edition of NFPA 1127, *Code for High Power Rocketry*, was prepared by the Technical Committee on Pyrotechnics and acted on by the National Fire Protection Association, Inc., at its Annual Meeting held May 22-25, 1995, in Denver, CO. It was issued by the Standards Council on July 21, 1995, with an effective date of August 11, 1995.

This edition of NFPA 1127 was approved as an American National Standard on August 11, 1995.

Origin and Development of NFPA 1127

Since 1978, technical progress in solid propellant rocket motors, rocket airframe materials, bonding agents, and construction techniques has resulted in the emergence of a new form of nonprofessional rocketry based on model rocketry but using larger and more powerful commercially-made solid propellant rocket motors in larger and heavier rocket airframes. This new activity is called "high power rocketry." Flying activities have taken place throughout the United States in locations where the authority having jurisdiction has been permissive of the activity and where the Federal Aviation Administration has granted waivers to Part 101 of the Federal Aviation Regulations. Therefore, more than a decade of operational experience has been accumulated. Safety rules, operational procedures, and other facets of the activity have been worked out and tested. The activity has spawned its own organization, The Tripoli Rocketry Association, Inc., which now has a representative on the NFPA Technical Committee on Pyrotechnics. The National Association of Rocketry, with longtime representation on the NFPA Technical Committee on Pyrotechnics, realizing the educational and sporting aspects of the activity, has also embraced high power rocketry. Both organizations believe that national standards, rules, and regulations can be and should be formalized at this time. Indeed, the experience gained thus far exceeds that amassed by model rocketry when the first NFPA Code for Model Rocketry, NFPA 44L, was adopted.

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

The NFPA Technical Committee on Pyrotechnics believes that this code contains appropriate measures to safeguard this popular and growing activity. Although not as widespread as model rocketry, the committee believes a separate NFPA code should be adopted for high power rocketry because of significant differences in operations and to prevent confusion of model rocketry and high power rocketry in the minds of public safety officials. Both of these consumer rocket activities should not be confused with the hazardous, uncontrolled operations of so-called "basement bombers" who attempt to make their own propellants, rocket motors, and large metallic rocket vehicles. High power rocket activities should be allowed within the specifications of this code to guide our science-minded citizens safely.

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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.

Committee Scope: This Committee shall have primary responsibility for documents on protection against the fire and life hazards associated with the manufacture, transportation, and storage of fireworks; fireworks used in outdoor displays; pyrotechnics used before a proximate audience; and the construction, launching, and other operations that involve unmanned rockets, including the manufacture of model rocket motors. This Committee does not have responsibility for documents on the use of fireworks by the general public.

Contents

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates explanatory material on that paragraph in Appendix A.

Information on referenced publications can be found in Chapter 7 and Appendix B.

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 high power rocket motors and motor components produced commercially for sale to or use by the certified user for education, recreation, and sporting competition.

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

1-1.3 This code also shall apply to the conduct of launch operations of high power 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 high power rocket or high power 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 college or university; or

(d) Any individual, firm, partnership, joint venture, corporation, or other business entity engaged, as a licensed for-profit business, in research, development, production, testing, maintenance, or supply of high power rockets, high power rocket motors, high power rocket propellant chemicals, or high power rocket components or parts for ultimate sale to qualified users in conformance with this code, or in connection with contracts with the federal or state governments or with commercial space transportation vehicle contractors or operating firms.

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 during the entire duration of their flight in the air. However, this code shall apply to rocket motors and motor reload components used in such devices.

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 fl oz) of water.

1-1.7 This code shall not apply to model rockets whose power and weight do not exceed the limits established in NFPA 1122, *Code for Model Rocketry;* fireworks rockets, skyrockets, and rockets with sticks, as defined in NFPA 1123, *Code for Fireworks Display;* NFPA 1124, *Code for the Manufacture, Transportation, and Storage of Fireworks;* or NFPA 1126, *Standard for the Use of Pyrotechnics before a Proximate Audience,* or other types of rockets not covered by this code.

1-2 Purpose.

1-2.1 The purpose of this code shall be to ensure the availability of high power rocket motors and components that meet national standards of safety and reliability stated herein to certified users.

1-2.2 The purpose of this code also shall be to establish guidelines for reasonably safe operation of high power rockets to protect the user and the public.

1-2.3 The purpose of this code also shall 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 high power rocket, as defined in this section.

Approved.* Acceptable to the authority having jurisdiction.

Arm. Rendering of an igniter from a safe (no energy) to a ready-to-fire condition.

Authority Having Jurisdiction.* The organization, office, or individual responsible for approving equipment, an installation, or a procedure.

Certified. Approved or endorsed authoritatively.

Certified High Power Rocket Motor.* A commercially made high power rocket motor that has been tested by a recognized testing organization that is acceptable to the authority having jurisdiction and found to meet the requirements set forth in this code.

Certified User.* An individual, distributor, or seller who has been tested or otherwise examined by a recognized organization that is acceptable to the authority having jurisdiction and found to be qualified to purchase, possess, and use high power rocket motors.

Code.* A standard that is an extensive compilation of provisions on a broad subject matter or that is suitable for adoption into law independently of other codes and standards.

Commercial Manufacturer. Any individual, firm, partnership, joint venture, corporation, or other business entity engaged as a licensed business in research, development, production, preparation, testing, maintenance, or supply of rockets, rocket motors, rocket propellant chemicals, rocket propellant, delay or ejection modules, or rocket components or parts.

Complex High Power Rocket. A high power rocket that is multistaged or propelled by a cluster of rocket motors intended for simultaneous ignition at launch or in the air.

High Power Rocket. A rocket vehicle:

(a) That is propelled by a single rocket motor having a total impulse of more than 160 newton-seconds or an installed total impulse of more than 320 newton-seconds and no more than 40,960 newton-seconds of installed total impulse;

(b) That weighs more than 1500 g (53 oz);

(c) That contains any single motor with an average thrust of more than 80 newtons;

(d) That contains a recovery device for returning it safely to the ground so it can be flown again;

(e) That is made of paper, wood, fiberglass, or plastic with the minimum amount of metallic parts necessary for airframe integrity dependent upon the installed total impulse, and whose primary use is for purposes of education, recreation, and sporting activities.

High Power Rocket Motor. A rocket motor that has more than 160 newton-seconds of total impulse or an average thrust of greater than 80 newtons and that otherwise meets the other requirements set forth in this code.

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.

Installed Total Impulse. The sum of the total impulses of all rocket motors installed in a rocket and intended to be ignited during the launching and flight of that rocket.

Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is 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.

Launch Site. An area used for high power rocket activities that includes the following:

(a) A prepping area(s);

(b) A launching area(s);

(c) A recovery area(s);

(d) A spectator area(s); and

(e) A parking area(s).

Launching Area. An area designated by the safety monitor in which high power rockets are placed on a launching device and ignited.

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.

Model Rocket. A rocket that weighs no more than 1500 g (53 oz), including propellant, and is propelled by a model rocket motor. It has structural parts made of paper, wood, or breakable plastic; it has a means for returning it to the ground so it can be flown again; and its primary use is for purposes of education, recreation, and sporting competition.

Model Rocket Motor. A solid propellant or pressurized liquid rocket motor that conforms to the requirements for model rocket motors as set forth in NFPA 1122, *Code for Model Rocketry*.

Module. A pyrotechnic component of a loadable or reloadable rocket motor in which its chemical composition is preloaded into a finished assembly that does not necessitate mixing of ingredients by the user.

Motor Reloading Kit. A package designed and produced by a commercial manufacturer that contains all of the components and parts necessary to reload and reuse a nonexpendable model rocket motor casing specifically designed and manufactured to use these components and parts. These components and parts normally include a propellant module(s), a new rocket motor nozzle, new insulation components, prepackaged delay and ejection modules, an electrical igniter, and the parts necessary to seal the casing during operation.

Parking Area. An area designated by the safety monitor where spectators park their vehicles.

Prepping Area. An area designated by the safety monitor where high power rockets and high power rocket motors are prepared for launch.

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 whose discharge involves no combustion or change of state.

Production Lot. A quantity of solid propellant rocket motors or reloading kits or a pyrotechnic module(s) produced during a single work shift, on the same motor manufacturing device, or using the same batch of pyrotechnic material.

Propellant. The material(s) utilized in a rocket motor that produces thrust by the discharge of a working fluid generated by combustion, decomposition, change of state, or other discharge of such material contained, carried, or stored within said rocket motor.

Range Safety Officer. See definition of safety monitor.

Recovery Area. An area designated by the safety monitor for the recovery of high power rockets.

Reloadable Rocket Motor. A rocket motor that has been designed and manufactured so that the user can load, reload, and reuse the pressure-resisting body or casing, using the parts and components of a motor reloading kit specifically designed, manufactured, and intended for use with that rocket motor casing by the manufacturer.

Rocket. A device that ascends into the air without use of aerodynamic lifting forces acting against gravity and that is propelled by one or more rocket motors.

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 discharge 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.

Safety Monitor. A certified user of high power rocket motors whose responsibilities and duties during the operation of high power rockets are to confirm a rocket's compliance with the applicable provisions of this code, ensure that the rocket will fly in a safe manner, designate the areas of the launch site, and oversee the safety of all spectators and participants.

Shall. Indicates a mandatory requirement.

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

Skyrockets or Rockets with Sticks. Commercially manufactured fireworks rockets not intended for reuse and that have been classified as Class 1.3G or 1.4G Explosives in accordance with U.S. Department of Transportation regulations.

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

Spectator. A nonparticipant whose primary purpose is to view a high power rocket launch.

Spectator Area. A designated area where spectators view a high power rocket launch.

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.

Structural Parts. The load-bearing parts of a rocket, specifically the nose cone, body tube, and fins.

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; it is considered to be a part of a rocket motor when and where it is used.

Chapter 2 Requirements for High Power Rocket Construction and Operation

2-1 User Certification. A person shall operate or fly a high power rocket only if that person is a certified user.

2-2 Operating Clearances. A person shall fly a high power rocket only in compliance with:

(a) This code;

(b) *United States Code*, Title 49, Section 1348, "Airspace Control and Facilities," 72 Statute 749, Section 307, Federal Aviation Act of 1958, covering *Federal Aviation Administration Regulations*, from *Code of Federal Regulations*, Title 14, Chapter 1, Subchapter F, Part 101, Paragraph 101.1 (a)(3)(ii)(a) through (d) or later revisions or amendments thereto; and

(c) Other applicable federal, state, and local laws, rules, regulations, statutes, and ordinances.

2-3 Preflight Inspection. A person shall fly a high power rocket only if it has been inspected and approved for operation immediately prior to flight by a safety monitor. The safety monitor shall confirm the rocket's compliance with the applicable provisions of this code and shall ascertain that the rocket will fly in a safe manner.

2-4 High Power Rocket Motors and Components.

2-4.1 A person shall use only commercially manufactured certified high power rocket motors or motor reloading kits or components.

2-4.2 No person shall dismantle, reload, or alter a single-use high power rocket motor. No person shall alter the components of a reloadable high power rocket motor or use the contents of a reloadable rocket motor reloading kit for a purpose other than those specified by the manufacturer in the rocket motor or reloading kit instructions.

2-5 Rocket Construction. A high power rocket shall be constructed in such a manner and with suitable materials to withstand the operating stresses and retain structural integrity under conditions expected or known to be encountered in flight.

2-6 Rocket Airframe Materials. A high power rocket vehicle intended to be propelled by one or more high power rocket motors shall be constructed using lightweight materials such as paper, wood, rubber, plastic, fiberglass, or, when necessary, ductile metal so that the rocket conforms to the other requirements of this code.

2-7 Stability. A person intending to operate a high power rocket shall determine its stability before flight. This person shall provide documentation of the location of the center of pressure and the center of gravity of the high power rocket to the safety monitor if the safety monitor requests same.

2-8 Weight and Power Limits.

2-8.1 A person intending to operate a high power rocket shall ensure that it weighs less than the rocket motor manufacturer's recommended maximum liftoff weight for the rocket motor(s) used for the flight. This person shall present documented proof of compliance with this requirement if it is requested by the safety monitor during preflight inspection.

2-8.2 A person shall not install in a high power rocket a rocket motor or combination of rocket motors that will produce more that 40,960 newton-seconds of total impulse (4.45 newtons equals 1.0 lb).

2-9 Recovery.

2-9.1 A person shall fly a high power rocket only if it contains a recovery system that will return all parts of it safely to the ground so it can be flown again.

2-9.2 The person preparing the high power rocket for flight shall install only flame-resistant recovery wadding if wadding is necessary by the design of the rocket.

2-9.3 A person shall not attempt to catch a high power rocket as it approaches the ground.

2-9.4 A person shall not attempt to retrieve a high power rocket from a hazardous area. The person flying the rocket shall attempt as soon as practicable to notify the utility company or other appropriate authority if the high power rocket becomes entangled in a power line when descending.

2-10 Payloads.

2-10.1 A person shall not install or incorporate in a high power rocket a payload that is intended to be flammable or explosive or to cause harm.

2-10.2 A person shall not fly a vertebrate animal in a high power rocket.

2-11 Launching Devices.

2-11.1 A person operating a high power rocket shall launch it from a stable device that provides rigid guidance until the rocket has reached a speed adequate to ensure a safe flight path.

2-11.2 The person launching the high power rocket shall ensure that the launcher incorporates a jet deflector device if necessary to prevent the rocket motor exhaust from impinging directly on flammable materials.

2-11.3 A launching device shall not be used to launch a high power rocket at an angle more than 20 degrees from vertical.

2-11.4 A person operating a high power rocket shall place the end of the launch rod or rail above eye level or cap it to prevent accidental eye injury. A person shall store a launch rod or rail so it is capped, cased, or left in a condition where it cannot cause injury.

2-12 Ignition Systems.

2-12.1 A person launching a high power rocket shall use an ignition system that is remotely controlled, is electrically operated, and contains a launching switch that will return to "off" when released.

2-12.2 The ignition system shall contain a removable safety interlock device in series with the launch switch.

2-12.3 The launch system and igniter combination shall be designed, installed, and operated so the liftoff of the rocket shall occur within 3 sec of actuation of the launch system. If the rocket is propelled by a cluster of rocket motors designed to be ignited simultaneously, the person operating the rocket shall install an ignition scheme that either has been previously tested or has a demonstrated capability of igniting all rocket motors intended for launch ignition within 1 sec following ignition system activation.

2-12.4 A person shall install an ignition device in a high power rocket motor at the launcher or within the area designated by the safety monitor. The rocket shall be pointed in a safe direction during and after installation of the ignition device.

2-12.5 No firing circuits shall be armed with the rocket in other than a launching position.

2-13* Launch Site.

2-13.1 A person shall launch a high power rocket only in an outdoor area where tall trees, power lines, and buildings will not present a hazard, in the opinion of the safety monitor, to the safe flight operation of a high power rocket.

2-13.2 A person shall not locate a launcher closer to the edge of the launch site than one-half the minimum launch site dimension stated in Table 2-13.2.

Table 2-13.2 Launch Site Dimensions

Installed Total Impulse (N-sec)	Equivalent Motor Type	Minimum Site Dimensions (ft)	(mi)	Equivalent (m)	(km)
160.01 — 320.00	H	1500	0.3	457	0.5
320.01 — 640.00	I	3000	0.6	914	1.0
640.01 — 1280.00	J	5280	1.0	1609	1.6
1280.01 — 2560.00	K	5280	1.0	1609	1.6
2560.01 — 5120.00	L	10,560	2.0	3219	3.2
5120.01 — 10,240.00	M	15,840	3.0	4828	4.8
10,240.01 — 20,480.00	N	21,120	4.0	6437	6.4
20,480.01 — 40,960.00	O	26,400	5.0	8047	8.0

NOTE: For a circular area, the minimum launch site dimension is the diameter in feet; for a rectangular area, it is the shortest side in feet.

2-13.3 The launch site shall be at least as large as that stated in Table 2-13.2.

2-13.4 As an alternative to the launch site dimensions, the size of the launch site shall be established as no less than one-half the maximum altitude expected, calculated, simulated, or granted (by FAA waiver/authority having jurisdiction) for the particular flight in question. In no case shall the minimum launch site dimension be less than 1500 ft (457 m).

2-13.5 In no case shall the minimum site dimension be less than one-half the estimated maximum altitude of the high power rocket.

2-14 Launcher Location.

2-14.1 The launch site shall contain no occupied buildings or public highways on which traffic flow exceeds ten vehicles per hour.

2-14.2 The person launching a high power rocket shall ensure that the ground for a radius of 10 ft (3 m) around the launcher is clear of brown grass, dry weeds, or other easy-to-burn materials that could be ignited during launch by the exhaust of the rocket motor.

2-14.3 The person intending to launch a high power rocket shall locate the launcher more than 1500 ft (457 m) from any occupied building or public highway on which traffic flow exceeds ten vehicles per hour.

2-15 Safe Distances.

2-15.1 No person shall be closer to the launch of a high power rocket than the person actually launching the rocket and those authorized by the safety monitor.

2-15.2 All spectators shall remain within an area determined by the safety monitor and shall remain behind the safety monitor and the person launching the rocket.

2-15.3 A person shall not be closer to the launch of a high power rocket than the applicable minimum safe distance set forth in Table 2-15.3.

Table 2-15.3 Safe Distances

Installed Total Impulse (N-sec)	Equivalent Motor	Minimum Safe Distance (ft)	(m)	Minimum Safe Distance (Complex Rocket)[1] (ft)	(m)
160.00 — 320.00	H	100	30	200	61
320.01 — 640.00	I	100	30	200	61
640.01 — 1280.00	J	100	30	200	61
1280.01 — 2560.00	K	200	61	300	91
2560.01 — 5120.00	L	300	91	500	152
5120.01 — 10,240.00	M	500	152	1000	305
10,240.01 — 20,480.00	N	1000	305	1500	457
20,480.01 — 40,960.00	O	1500	457	2000	610

[1]A "complex" high power rocket is one that is multistaged or propelled by a cluster of motors.

2-16 Launch Operations.

2-16.1 A person shall not ignite and launch a high power rocket horizontally, at a target, or so the rocket's flight path goes into clouds or beyond the boundaries of the launch site.

2-16.2 A person shall not launch a high power rocket if the surface wind at the launcher is more than 20 mph (32 km/hr).

2-16.3 A person shall not operate a high power rocket in a manner that is hazardous to aircraft.

2-17 Launch Control.

2-17.1 A person shall launch a high power rocket only with the immediate knowledge, permission, and attention of the safety monitor.

2-17.2 All persons in the launching, prepping, spectator, and parking areas during a countdown and launch shall be standing and facing the launcher if requested to do so by the safety monitor.

Exception: Those individuals that have mobility restrictions.

2-17.3 The person launching a high power rocket shall precede the launch with a 5-sec countdown audible throughout the launching, spectator, and parking areas. This countdown shall be given by the person launching the rocket, the safety monitor, or other flying site operating personnel.

2-17.4 No person shall approach a high power rocket that has misfired until the safety interlock has been removed or the battery has been disconnected from the ignition system, 1 min has passed, and the safety monitor has given permission for only a single person to approach the misfired rocket to inspect it.

2-18 Storage of High Power Rocket Motors, Motor Reloading Kits, and Pyrotechnic Modules.

2-18.1 High power rocket motors, motor reloading kits, and pyrotechnic modules shall be stored in reclosable, noncombustible containers away from open flames and sources of heat.

2-18.2 Smoking or open flames shall not be permitted in the launching area, prepping area, or within 25 ft (7.6 m) of any high power rocket motors, motor reloading kits, or pyrotechnic modules.

NOTE: A Tentative Interim Amendment has been issued on the following text; see page 1127-15.

2-18.3 No more than 25 lb (11.3 kg) of net propellant weight of high power rocket motors, motor reloading kits, or pyrotechnic modules shall be stored in a single-family dwelling.

2-18.3.1 Storage in a duplex or multifamily residence shall be permitted if no more than 25 lb (11.3 kg) of net propellant weight of high power rocket motors, motor reloading kits, or pyrotechnic modules is enclosed in a reclosable, noncombustible container and kept in a wooden box or cabinet having a self-closing lid and all surfaces are at least 1-in. (2.5-cm) nominal thickness, when approved by the authority having jurisdiction.

2-18.3.2 Storage of more than 25 lb (11.3 kg) net propellant weight of high power rocket motors, motor reloading kits, or pyrotechnic modules shall be in accordance with Title 27, *Code of Federal Regulations*, Part 55.

2-18.4 High power rocket motors, motor reloading kits, and pyrotechnic modules shall be stored in accordance with all applicable federal, state, and local laws, rules, regulations, statutes, and ordinances.

Chapter 3 Requirements for High Power Rocket Motors

3-1 Solid Propellant High Power Rocket Motors.

3-1.1 A solid propellant high power rocket motor shall be a device produced by a commercial manufacturer and shall have all of the propellant either preloaded into the motor casing if a solid propellant high power rocket motor is designed to be expendable, or shall be available in a premanufactured module(s) if the propellant is designed to be used in a reloadable, nonexpendable solid propellant high power rocket motor.

3-1.1.1 The solid propellant high power rocket motor shall be designed in such a manner that the propellant:

(a) Cannot be removed without destroying the motor; or

(b) Is a premanufactured module(s) intended to be easily inserted into a reloadable, nonexpendable solid propellant high power rocket motor.

3-1.1.2 Delay trains and ejection charges shall be permitted to be included as an integral part of the motor or shall be permitted to be packaged separately if these auxiliary packages are designed so that, in the opinion of the authority having jurisdiction, an individual would have no difficulty handling and using them safely.

3-1.1.3 Propellant grains packaged in motor reloading kits for reloadable high power rocket motors shall be shipped and stored in an insulating sleeve having a low thermal conductivity and shall be of equal or greater length than the propellant grain and have a thickness of not less than 0.030 in. (0.80 mm).

3-1.2 A solid propellant high power rocket motor shall be designed so that the temperature of the external surface of the motor casing shall not exceed 392°F (200°C) during or after operation.

3-1.3 A solid propellant high power rocket motor casing shall be so designed and constructed that, if it ruptures, it will not project any casing fragments beyond a radial distance of one-half the distance shown as a safe distance in Table 2-15.3.

3-1.4 A solid propellant high power rocket motor whose casing is metallic shall be so designed and constructed that its normal failure mode shall lead to all separated parts traveling along the longitudinal axis of the motor. Such metal casings shall be made of aluminum (6061-T6 or equivalent alloy) and, if used in reloadable motors, shall be designed to contain at least twice the design maximum operating pressure of the motor before allowing failure to occur.

3-1.5 A solid propellant high power rocket motor or motor reloading kit or component shall be so designed and constructed as to be incapable of ignition when subjected to temperatures of 125°C (257°F) for a duration of no less than 30 min.

3-2 Manufacturer Requirements.

3-2.1 A manufacturer of a solid propellant high power rocket motor shall subject a random sample of 1 percent of each production lot to a static test that shall measure and record the high power rocket motor's total impulse, delay time, and action of ejection charge, if included. Solid propellant high power 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 certified mean total impulse value of the high power 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 high power rocket motor type. However, in no case shall this variation exceed 3 sec.

(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.

Exception: As an alternative to a random sample of 1 percent of each production lot, a written quality control plan and record keeping acceptable to the recognized testing organization or the authority having jurisdiction shall be permitted to be maintained for production lots of propellant composition, delay composition, and motor components to ensure compliance with 3-2.1(a), (b), (c), and (d).

3-2.2 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 above-mentioned conditions, the entire production lot shall be corrected or destroyed by the manufacturer.

3-2.3 An expendable or reloadable solid propellant high power rocket motor or motor reloading kit whose performance deviates from the sample test criteria and performance limits detailed above within three years from the date of manufacture shall be withdrawn from commercial sale and redesigned to provide reliable operation when ignited within a period of three years from the date of manufacture. If the expected shelf life is less than ten years, the manufacturer shall imprint a "use before" date on the package or motor casing.

3-2.4 No manufacturer, distributor, or other person shall sell, offer to sell, expose for sale, or otherwise make available to the public any type of high power rocket motor ignition device that is intended to be initiated by a hand-held flame.

3-3 Shipping and Packaging.

3-3.1 A solid propellant high power rocket motor shall be shipped and stored with no ignition element installed.

3-3.2 A solid propellant high power rocket motor or motor reloading kit 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 high power rocket motor only according to instructions. In addition, the instructions shall contain the following:

(a) Information on how to safely ignite the high power rocket motor by electrical means;

(b) Performance data on the high power rocket motor type, including 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) Information on the proper and safe disposal of the high power rocket motor, motor reloading kit, or pyrotechnic module, if it has become too old, has been subjected to conditions that could impair its performance, or, in the opinion of the user, has become unsafe;

(e) Any special action that shall be taken to fight any fire in which stored high power rocket motors, motor reloading kits, or modules are involved; and

(f) If a motor reloading kit, safety precautions for handling the propellant and pyrotechnic materials and for cleaning and other necessary post-firing maintenance on the motor casing.

3-3.3 The package containing the motor reloading kit for use in a nonexpendable, reloadable high power rocket motor shall have visible identification that will identify the motor casing type in which it must be installed. The package containing the motor reloading kit shall display instructions that the kit shall not be opened until the user is ready to install the motor reloading kit parts, including the propellant module(s), in the nonexpendable, reloadable high power rocket motor casing.

3-3.4 A high power rocket motor or motor reloading kit shall have imprinted on its external surface or package the name of the importer, manufacturer, or distributor and a recognized code indicating its nominal performance parameters. It shall also have imprinted on its external surface or package a lot number or manufacture date, which shall be permitted to be encoded.

3-3.5 High power rocket motors, motor reloading kits, and pyrotechnic components shall be marked with information complying with the Federal Hazardous Substances Act of Title 16, *Code of Federal Regulations,* Part 1500.

Chapter 4 High Power Solid Propellant Rocket Motor Testing and Certification

4-1 Certification Requirement. A high power rocket motor type or motor reloading kit offered for sale, exposed for sale, sold, used, or made available shall be examined and tested by the authority having jurisdiction to determine whether or not the type complies with the requirements and tests detailed in Chapter 3.

4-1.1 The authority having jurisdiction shall certify as acceptable for sale and use those high power rocket motor types and motor reloading kits that do comply.

4-1.2* At the discretion of the authority having jurisdiction, such examination, testing, and certification shall be permitted to be carried out by an approved testing laboratory or a national user organization having such capabilities.

4-1.3 A prerequisite for this certification of a solid propellant high power rocket motor or motor reloading kit shall be its prior classification by the U.S. Department of Transportation as a UN Division 1.3 or 1.4 Explosive or a written acknowledgment from the U.S. Department of Transportation that the high power rocket motor or motor reloading kit is a flammable solid.

4-1.4 The authority having jurisdiction shall examine an appropriate number of samples of a motor or reloadable motor system for the following conditions before granting such certification:

(a) Verification that propellant composition complies with NFPA 1125, *Code for the Manufacture of Model Rocket and High Power Rocket Motors*;

(b) Static testing to determine that total impulse and delay time comply with the requirements of 3-2.1;

(c) For metal casing motors, destructive testing to ensure that the casing complies with the requirements of 3-1.4;

(d) Thermal testing to ensure that the casing temperature during and after static firing complies with 3-1.2;

(e) Heat sensitivity testing to ensure that the motor or motor reloading kit complies with 3-1.5; and

(f) Examination of the packaging, labeling, and instructions to verify compliance with all provisions of this code.

4-1.5 Within 30 days, manufacturers shall report to the authority that originally certified a motor, motor reloading kit, or component any changes in the design or performance of such motor, motor reloading kit, or component made after its certification testing.

4-2 List of Certified High Power Rocket Motors. The authority having jurisdiction shall maintain a current and complete list of all those high power rocket motor types and motor reloading kits that are certified as complying with the requirements and tests detailed in Chapter 3 and shall make copies of this list available to citizens and public safety officials who request it.

Chapter 5 High Power Rocket Motor User Certification

5-1 Sales Only to Certified Users. A high power solid propellant rocket motor or motor reloading kit shall be sold to, shipped to, stored by, and used only by certified users.

NOTE: A Tentative Interim Amendment has been issued on the following text; see page 1127-15.

5-2 Maintenance of Selling Records.

5-2.1 High power solid propellant rocket motor manufacturers, distributors, and sellers shall maintain a list of those certified users to whom they have sold high power solid propellant rocket motors or motor reloading kits. This list shall contain the following information:

(a) Name and address of the purchaser;

(b) Name and address of the national user organization that has certified the user;

(c) The type and number of high power solid propellant rocket motors or motor reload kits sold to the certified user; and

(d) The date of sale and shipment of high power solid propellant rocket motors or motor reload kits to the certified user.

5-2.2 The manufacturer, distributor, or seller shall make available, on request and at a reasonable time, the records specified in 5-2.1 to any law enforcement person or the authority having jurisdiction. These records shall be kept for five years from the date of sale.

5-3 User Certification Provisions.

5-3.1 A person who is a certified user shall meet the following minimum provisions:

(a) The person shall be at least 18 years of age and shall provide proof of age upon applying for certification.

(b) The person shall show a level of knowledge and competence acceptable to the certifying organization in handling, storing, and using a high power solid propellant rocket motor and high power rockets.

(c) The person shall be a citizen of the United States of America and shall have no felony convictions.

(d) The person shall possess a low explosives user permit or other such permit as required by the Bureau of Alcohol, Tobacco, and Firearms for the handling of explosive materials.

5-3.2 The certifying organization shall maintain a list of all persons it has certified as high power rocket motor users. This list shall be updated on a regular basis. Copies and updated copies of this list shall be, upon request, sent to all manufacturers of certified high power rocket motors and motor reload kits. The organization shall, upon request and at a reasonable time, make available to any law enforcement official or authority having jurisdiction a copy of the list of certified users.

Chapter 6 Prohibited Activities

6-1 Prohibited Acts. The following activities shall be prohibited by this code:

(a) The use of a high power rocket motor for the primary purpose of producing a spectacular display of color, light, sound, or any combination thereof.

Exception No. 1: This prohibition shall not be construed as prohibiting the public demonstration of high power rockets as defined herein and as certified according to these regulations.

Exception No. 2: This prohibition shall not be construed as prohibiting the use of chemical additives to the propellant to produce a brightly colored exhaust flare or dense colored smoke to aid in following or tracking the rocket in flight.

(b) The use of a high power rocket or high power rocket motor as a weapon against a target.

(c) Tampering with a high power rocket motor, motor reloading kit, or module in any manner or degree that is contrary to the purpose for which said high power rocket motor or motor reloading kit is designed and intended to be used.

(d) The sale, offering for sale, exposing for sale, or otherwise making available a rocket motor or motor reloading kit that does not comply with the requirements herein and has not been certified in accordance with Chapter 4.

Exception No. 1: This prohibition shall not be construed as prohibiting the transfer of rocket motors or motor reloading kits to a certifying authority for the purpose of testing for certification.

Exception No. 2: This prohibition shall not be construed as prohibiting the transfer, sale, offering for sale, exposing for sale, or otherwise making available model rocket motors, motor reloading kits, or modules complying with NFPA 1122, Code for Model Rocketry.

(e) The operation, discharge, or activation of a high power rocket contrary to the provisions of Federal Aviation Administration regulations.

(f) The manufacture, production, fabrication, operation, maintenance, launch, flight, test, discharge, or other experimentation with high power rocket motors, motor reloading kits, or pyrotechnic modules 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, including monopropellants, for solid, liquid, and hybrid rocket motors.

Exception: This prohibition shall not be construed as prohibiting the evaluation and certification of new high power rocket motor technology by a recognized national user organization or an authority having jurisdiction, provided that all other requirements of this code are complied with and all activities are in accordance with applicable federal, state, and local laws, regulations, and ordinances.

(g) 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 high power rocket motor.

(h) Affixing to a high power rocket motor or motor reloading kit 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.

(i) Reloading any expendable, disposable solid propellant high power rocket motor with any material once said motor has been operated; or reloading any reloadable, nonexpendable solid propellant high power rocket motor with any material or by any means not specifically provided or recommended by the manufacturer.

(j) Selling or conveying a high power rocket motor or motor reloading kit to any person who is not a certified user.

Exception: This prohibition shall not be construed as prohibiting the transfer of a single high power rocket motor or motor reloading kit for the purpose of user certification.

(k) Possession, storage, or use of a high power rocket motor or motor reloading kit by any person who is not a certified user.

Exception: This prohibition shall not be construed as prohibiting the possession, storage, or use of a single high power rocket motor or motor reloading kit for the purpose of user certification.

(l) Persons participating in the prepping or launching of high power rockets, including spectators in the prepping areas, that have consumed alcohol, narcotics, medication, or drugs that could affect judgment, movement, or stability.

(m) The storage of high power rocket motors, motor reloading kits, or modules contrary to the regulations of the U.S Bureau of Alcohol, Tobacco and Firearms.

(n) The transporting of high power rocket motors, motor reloading kits, or modules contrary to the regulations of the U.S. Department of Transportation.

Chapter 7 Referenced Publications

7-1 The following documents or portions thereof are referenced within this code and shall be considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

7-1.1 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.

NOTE: See Tentative Interim Amendment on page 1127-15.

NFPA 1122, *Code for Model Rocketry*, 1994 edition.

NFPA 1123, *Code for Fireworks Display*, 1995 edition.

NFPA 1124, *Code for the Manufacture, Transportation, and Storage of Fireworks*, 1995 edition.

NFPA 1125, *Code for the Manufacture of Model Rocket and High Power Rocket Motors*, 1995 edition.

NFPA 1126, *Standard for the Use of Pyrotechnics before a Proximate Audience*, 1992 edition.

7-1.2 U.S. Government Publications. Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Code of Federal Regulations, Title 16, Part 1500.

Code of Federal Regulations, Title 27, Part 55.

Code of Federal Regulations, Title 49, Parts 100 to end.

Federal Aviation Administration Regulations, from *Code of Federal Regulations*, Title 14, Chapter 1, Subchapter F, Part 101.1 (a)(3)(ii), or revisions or amendments thereto.

United States Code, Title 49, Section 1348, "Airspace Control and Facilities," 72 Statute 749, Section 307.

Appendix A Explanatory Material

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

A-1-3 Approved. 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, 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 that is in a position to determine compliance with appropriate standards for the current production of listed items.

A-1-3 Authority Having Jurisdiction. 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, or 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 or her 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.

A-1-3 Certified High Power Rocket Motor. Recognized testing organizations that certify high power rocket motors include, but are not limited to, Tripoli Rocketry Association, Inc., the National Association of Rocketry, or their successor organizations.

A-1-3 Certified User. A certified user includes, but is not limited to, an individual who has licenses or certificates from Tripoli Rocketry Association, Inc., the National Association of Rocketry, or their successor organizations.

A-1-3 Code. The decision to designate a standard as a "Code" is based on such factors as the size and scope of the document, its intended use and form of adoption, and whether it contains substantial enforcement and administrative provisions.

A-1-3 Listed. 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.

A-2-13 First Aid. First aid facilities or medical help suitable to the number of participants and spectators and the maximum size, weight, and power of the rockets operated should be made available.

A-4-1.2 Recognized testing organizations include, but are not limited to, Tripoli Rocketry Association, Inc., the National Association of Rocketry, or their successor organizations.

Appendix B Referenced Publications

B-1 The following documents or portions thereof are referenced within this code for informational purposes only and thus are not considered part of the requirements of this document. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

B-1.1 NAR Publication. National Association of Rocketry, P.O. Box 177, Altoona, WI 54720-0177.

High Power Rocket Safety Code of the National Association of Rocketry, 1991.

B-1.2 Tripoli Rocketry Association Publication. Tripoli Rocketry Association, Inc., P.O. Box 339, Kenner, LA 70063-0339.

High Power Rocket Safety Code of Tripoli Rocketry Association, Inc.

Index

Tentative Interim Amendment

NFPA 1127

Code for High Power Rocketry

1995 Edition

Reference: 2-18.3, 2-18.4, 5-2(New)
TIA 95-1 (NFPA 1127)

Pursuant to Section 4 of the NFPA Regulations Governing Committee Projects, the National Fire Protection Association has issued the following Tentative Interim Amendment to NFPA 1127, *Code for High Power Rocketry*, 1995 edition. The TIA was processed by the Pyrotechnics Committee and was issued by the Standards Council on July 21, 1995, with an effective date of August 11, 1995.

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 2-18.3 in proposed NFPA 1127, 1995 edition, to read as follows:

2-18.3 No more than 50 lb (22.7 kg) of net propellant weight of high power rocket motors, motor reloading kits, or pyrotechnic modules shall be stored in a Type 3 or a Type 4 indoor magazine as described in NFPA 495, *Explosive Materials Code*. Indoor magazines shall be painted red, and the top shall bear the words "EXPLOSIVES — KEEP FIRE AWAY" in white letters at least 3 in. (76 mm) high.

Exception: This requirement shall not apply to solid propellant rocket motors, motor reloading kits, pyrotechnic modules, or any other solid propellant rocket motor products that are exempt under Title 27, Code of Federal Regulations, Part 55, Subpart H, Section 55.141.

2-18.3.1 The magazine shall not be located in any residence.

2-18.3.2 The indoor magazine shall be permitted to be located in a detached garage or outbuilding substantially removed or segregated from any residence.

2-18.3.3 The indoor magazine shall be permitted to be located in an attached garage in a single-family residence.

2-18.3.4 The indoor magazine shall be permitted to be located in an attached garage of a multifamily residence or duplex if the magazine is surrounded on all sides by a 1-hr fire-rated barrier.

2. Add the following new section 2-18.4 to proposed NFPA 1127, 1995 edition, to read as follows and renumber existing section 2-18.4 as 2-18.5:

(Continued)

2-18.4 Large Quantity Storage.

2-18.4.1 More than 50 lb (22.7 kg) of net propellant weight of high power rocket motors, motor reloading kits, or pyrotechnic modules shall be stored in a Type 4 outdoor magazine or greater as described in NFPA 495, *Explosive Materials Code*, and Title 27, *Code of Federal Regulations*, Part 55.

Exception: This requirement shall not apply to solid propellant rocket motors, motor reloading kits, pyrotechnic modules, or any other solid propellant rocket motor products that are exempt under Title 27, Code of Federal Regulations, Part 55, Subpart H, Section 55.141.

2-18.4.2 The magazine shall meet the distance requirements in Table 2-18, Table of Storage Distances for Low Explosives.

Table 2-18 Table of Storage Distances for Low Explosives

Pounds (kg)				Distances in Feet (m)					
Over		Not Over		From Inhabited Building		From Public Railroad and Highway		From Above-Ground Magazine	
0	(0)	1000	(454)	75	(23)	75	(23)	50	(15)
1000	(454)	5000	(2268)	115	(35)	115	(35)	75	(23)
5000	(2268)	10,000	(4536)	150	(46)	150	(46)	100	(30)
10,000	(4536)	20,000	(9072)	190	(58)	190	(58)	125	(38)
20,000	(9072)	30,000	(13,608)	215	(66)	215	(66)	145	(44)
30,000	(13,608)	40,000	(18,144)	235	(72)	235	(72)	155	(47)
40,000	(18,144)	50,000	(22,680)	250	(76)	250	(76)	165	(50)
50,000	(22,680)	60,000	(27,216)	260	(79)	260	(79)	175	(53)
60,000	(27,216)	70,000	(31,751)	270	(82)	270	(82)	185	(56)
70,000	(31,751)	80,000	(36,287)	280	(85)	280	(85)	190	(58)
80,000	(36,287)	90,000	(40,823)	295	(90)	295	(90)	195	(59)
90,000	(40,823)	100,000	(45,360)	300	(91)	300	(91)	200	(61)
100,000	(45,360)	200,000	(90,718)	375	(114)	375	(114)	250	(76)
200,000	(90,718)	300,000	(136,078)	450	(137)	450	(137)	300	(91)

* Table is extracted from 27 CFR, Part 55 (BATF regulations for the storage of explosive materials).

3. Insert a new section 5-2 to proposed NFPA 1127, 1995 edition, to read as follows:

5-2 User Permit Requirements. A "User of Low Explosives Permit" as defined in Title 27, *Code of Federal Regulations*, Part 55, is required prior to both of the following:

(a) Acquisition by a certified user of a high power solid propellant rocket motor(s) or motor reloading kit(s) in a state other than where the user resides.

Exception No. 1: This requirement shall not apply to the transportation, shipment, or receipt of high power rocket motor(s) or motor reloading kit(s) by a nonpermittee who lawfully purchases high power rocket motor(s) or motor reloading kit(s) from a licensee in a state contiguous to the purchaser's state of residence, if the purchaser's state of residence has enacted legislation, currently in force, specifically authorizing a resident of that state to purchase explosive materials in a contiguous state.

Exception No. 2: This requirement shall not apply to solid propellant rocket motors, motor reloading kits, pyrotechnic modules, or any other solid propellant rocket motor products that are exempt under Title 27, Code of Federal Regulations, Part 55, Subpart H, Section 55.141.

(b) Transportation by a certified user of a high power solid propellant rocket motor(s) or motor reloading kit(s) to a state other than where the user resides.

(Continued)

Exception No. 1: This requirement shall not apply to the transportation, shipment, or receipt of high power rocket motor(s) or motor reloading kit(s) by a nonpermittee who lawfully purchases high power rocket motor(s) or motor reloading kit(s) from a licensee in a state contiguous to the purchaser's state of residence, if the purchaser's state of residence has enacted legislation, currently in force, specifically authorizing a resident of that state to purchase explosive materials in a contiguous state.

Exception No. 2: This requirement shall not apply to solid propellant rocket motors, motor reloading kits, pyrotechnic modules, or any other solid propellant rocket motor products that are exempt under Title 27, Code of Federal Regulations, Part 55, Subpart H, Section 55.141.

4. Renumber the subsequent portions of Chapter 5.

5. Add the following referenced publications to the existing list in Chapter 7, Referenced Publications.

7-1.1 NFPA Publications.

NFPA 495, *Explosive Materials Code,* 1992 edition.

7-1.2 U.S. Government Publications

Title 27, *Code of Federal Regulations,* Part 55.

The NFPA Codes and Standards Development Process

Since 1896, one of the primary purposes of the NFPA has been to develop and update the standards covering all areas of fire safety.

Calls for Proposals
The code adoption process takes place twice each year and begins with a call for proposals from the public to amend existing codes and standards or to develop the content of new fire safety documents.

Report on Proposals
Upon receipt of public proposals, the technical committee members meet to review, consider, and act on the proposals. The public proposals – together with the committee action on each proposal and committee-generated proposals – are published in the NFPA's Report on Proposals (ROP). The ROP is then subject to public review and comment.

Report on Comments
These public comments are considered and acted upon by the appropriate technical committees. All public comments – together with the committee action on each comment – are published as the Committee's supplementary report in the NFPA's Report on Comments (ROC).

The committee's report and supplementary report are then presented for adoption and open debate at either of NFPA's semi-annual meetings held throughout the United States and Canada.

Association Action
The Association meeting may, subject to review and issuance by the NFPA Standards Council, (a) adopt a report as published, (b) adopt a report as amended, contingent upon subsequent approval by the committee, (c) return a report to committee for further study, and (d) return a portion of a report to committee.

Standards Council Action
The Standards Council will make a judgement on whether or not to issue an NFPA document based upon the entire record before the Council, including the vote taken at the Association meeting on the technical committee's report.

Voting Procedures
Voting at an NFPA Annual or Fall Meeting is restricted to members of record for 180 days prior to the opening of the first general session of the meeting, except that individuals who join the Association at an Annual or Fall Meeting are entitled to vote at the next Fall or Annual Meeting.

"Members" are defined by Article 3.2 of the Bylaws as individuals, firms, corporations, trade or professional associations, institutes, fire departments, fire brigades, and other public or private agencies desiring to advance the purposes of the Association. Each member shall have one vote in the affairs of the Association. Under Article 4.5 of the Bylaws, the vote of such a member shall be cast by that member individually or by an employee designated in writing by the member of record who has registered for the meeting. Such a designated person shall not be eligible to represent more than one voting privilege on each issue, nor cast more than one vote on each issue.

Any member who wishes to designate an employee to cast that member's vote at an Association meeting in place of that member must provide that employee with written authorization to represent the member at the meeting. The authorization must be on company letterhead signed by the member of record, with the membership number indicated, and the authorization must be recorded with the President of NFPA or his designee before the start of the opening general session of the Meeting. That employee, irrespective of his or her own personal membership status, shall be privileged to cast only one vote on each issue before the Association.

Sequence of Events Leading to Publication of an NFPA Committee Document

Call for proposals to amend existing document or for recommendations on new document.

▼

Committee meets to act on proposals, to develop its own proposals, and to prepare its report.

▼

Committee votes on proposals by letter ballot. If two-thirds approve, report goes forward. Lacking two-thirds approval, report returns to committee.

▼

Report is published for public review and comment. (Report on Proposals - ROP)

▼

Committee meets to act on each public comment received.

▼

Committee votes on comments by letter ballot. If two-thirds approve, supplementary report goes forward. Lacking two-thirds approval, supplementary report returns to committee.

▼

Supplementary report is published for public review. (Report on Comments - ROC).

▼

NFPA membership meets (Annual or Fall Meeting) and acts on committee report (ROP and ROC).

▼

Committee votes on any amendments to report approved at NFPA Annual or Fall Meeting.

▼

Complaints to Standards Council on Association action must be filed within 20 days of the NFPA Annual or Fall Meeting.

▼

Standards Council decides, based on all evidence, whether or not to issue standard or to take other action, including hearing any complaints.

▼

Appeals to Board of Directors on Standards Council action must be filed within 20 days of Council action.

FORM FOR PROPOSALS ON NFPA TECHNICAL COMMITTEE DOCUMENTS

Mail to: Secretary, Standards Council
National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02269-9101
Fax No. 617-770-3500

Note: All proposals must be received by 5:00 p.m. EST/EDST on the published proposal-closing date.

If you need further information on the standards-making process, please contact the Standards Administration Department at 617-984-7249.

Date 9/18/93 **Name** John B. Smith **Tel. No.** 617-555-1212

Company _____

Street Address 9 Seattle St., Seattle, WA 02255

Please Indicate Organization Represented (if any) Fire Marshals Assn. of North America

1. a) NFPA Document Title National Fire Alarm Code **NFPA No. & Year** NFPA 72, 1993 ed.

b) Section/Paragraph 1-5.8.1 (Exception No.1)

FOR OFFICE USE ONLY
Log # _____
Date Rec'd _____

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: (Note: State the problem that will be resolved by your recommendation; give the specific reason for your proposal including copies of tests, research papers, fire experience, etc. If more than 200 words, it may be abstracted for publication.)

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

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

Note 1: Type or print legibly in black ink.
Note 2: 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.

I hereby grant NFPA the non-exclusive, royalty-free rights, including non-exclusive, royalty-free rights in 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 (Required)

PLEASE USE SEPARATE FORM FOR EACH PROPOSAL