

# Safety Code for High-Power Rocketry

## Tripoli Rocketry Association

This High-Power Rocketry Safety Code is the product of many years of effort on behalf of the hobby by those who care about it and whose prime interest is safety. This document sets minimum standards, intended to preserve the hobby in a safe environment. Using this Code as the minimum, it will be your responsibility to regulate your own launches safely for the conditions of each launch site. This Safety Code shall be the standard at all Tripoli Sanctioned Launches.

The Tripoli High-Power Safety Code *supplements NFPA 1127 Code for High Power Rocketry* with sections that are specific to Tripoli. The foundation of the Tripoli High Power Safety Code is NFPA 1127.

### 1 General Requirements

#### 1-1 Scope

**1-1.1** This code shall set practices for safe operation of High Power rocket launches. It will also address some aspects of safe rocket design, and construction, and limitations of motor power, for use by the certified user for the purposes of education, recreation and sporting use.

#### 1-2 Purpose

**1-2.1** The purpose of this code shall be to establish guidelines for reasonably safe operation of rockets at Tripoli Sanctioned Launches.

#### 1-3 Definitions:

For the purposes of this code, the following terms shall be defined as stated in this section. Some of these may be redundant from NFPA 1127.

**Insured Flier:** A flier that has insurance provided by Tripoli or any rocketry organization that TRA has insurance reciprocity with. At this writing this includes NAR only. Note: some types of TRA membership do not include insurance (e.g. Associate, and Honorary members).

**Adult Flier:** An *Insured Flier* that is 18 years old or older.

**High Power Rocketry Flier (HPR Flier):** An *Adult Flier* that is certified to fly High Power rockets at their certification level.

**Model Rocket Fliers (MR Flier):** An Insured Flier who is not certified to fly High Power rockets.

**Invited Guests of Fliers (Guests):** A person who is not a member of a recognized rocketry organization/not covered by insurance.

**Launch Director (LD):** A Level 2 or Level 3 flier who has overall administrative responsibility for the launch.

**Participants.** Persons that are either:

- **HPR Fliers.**
- **Model Rocket Fliers.**
- **Invited Guests of Fliers.**

**Range Safety Officer (RSO).** A Level 2 or Level 3 flier who has the authority to ensure the safe operation of the range.

**Sanctioned Launch.** A sanctioned launch is a *Tripoli Insured Launch*. Any *Sanctioned Launch* shall meet **ALL** of the following requirements:

- Responsible person of launch shall be member of Tripoli in good standing.
- Follows the appropriate Tripoli Safety Code.
- All AHJ (e.g. FAA waiver) requirements/regulations met and any required permits secured.
- Landowner permission has been formally obtained.

**Shall.** Indicates a mandatory requirement.

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

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

**Spectator Area.** An area designated where spectators view a rocket launch.

**Tripoli Mentoring Program (TMP).** Program to permit Tripoli Junior members to participate in supervised high power rocketry activities.

**Tripoli (TRA).** Tripoli Rocketry Association, Inc.

## Requirements for High Power Rocket Operation

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

- This code and NFPA 1127;
- *Federal Aviation Administration Regulations*, Part 101 (Section 307,72 Statute 749, Title 49 United States Code, Section 1348, "Airspace Control and Facilities," Federal Aviation Act of 1958);
- Other applicable federal, state, and local laws, rules, regulations, statutes, and ordinances.
- Landowner permission.

### **3 Legality**

- 3-1** The Tripoli Rocketry Association does not claim Rocketry to be legal in every municipality, state or political jurisdiction.

### **4 Insurance**

- 4-1** Tripoli rocketry activities are only insured when the provisions of this code are followed.
- 4-2** No Tripoli member shall misrepresent to any authority or landowner that Tripoli activities are insured .

### **5 Participation,**

*Participation Note: The information provided below identifies the minimum requirements for individuals that participate/attend Tripoli Sanctioned Launches.*

A Launch Director has the authority to impose more stringent rules.

#### **Participation and Access at Tripoli Launches shall be limited to the following:**

- 5-1** HPR Fliers may access and conduct flights from the High-Power Launch Area and/or Model Rocket Launch Area.
- 5-2** Non-Tripoli Members age 18 and over who are students of an accredited educational institution may participate in joint projects with Tripoli members.
  - 5-2.1** These individuals are only allowed in the High-Power Launch Area while supervised by an HPR Flier.
  - 5-2.2** They are only allowed in the Model Rocket Launch Area while supervised by an Adult Flier.
  - 5-2.3** The maximum number of nonmember participants shall not exceed five (5) per supervising flier.
- 5-3** Tripoli Junior Members who have successfully completed the TMP may access and conduct flights from the High-Power Launch Area while under the direct supervision of a Tripoli HPR Flier in accordance with the rules of the TMP.
  - 5-3.1** The maximum number of TMP participants shall not exceed five (5) per supervising flier.
- 5-4** Children younger than 18 years of age may conduct flights from the Model Rocket Launch Area under the direction of an Adult Flier.
- 5-5** An invited guest may be permitted in the Model Rocket Launch Area and preparation areas upon approval of the RSO. Invited guests are not permitted in the High-Power Launch Area.
- 5-6** Spectators are only permitted in the spectator area(s); they are not permitted in the High-Power Launch Area or Model Rocket Launch Area.

## **6 Tripoli Launch Operations**

**6-1** Insured Fliers shall provide proof of membership and certification status upon request.

**6-2** All flights and static motor tests conducted by a member shall be within the member's certification level, with the exception of permitted certification attempts.

**6-3** When three or more rockets are to be launched simultaneously, the minimum spectator and participant distance shall be the value set forth in the Safe Distance Table for a complex rocket with the same total installed impulse, but not more than 610 m (2000 ft), or 1.5 times the highest altitude expected to be reached by any of the rockets, whichever is less.

**6-4** No range activity shall be conducted when a thunderstorm has been reported within ten miles, or less, of the launch site or if thunder or lightning is present.

**6-5** No rockets shall be launched when the surface winds exceed 20 MPH (32 KPH)

**6-6** The minimum safe standoff distance from the spectator area for the Model Rocket Launch Area shall be 50 feet (15 meters).

**6-7** All flights planned to exceed 50,000ft AGL shall be submitted to the Class 3 review Committee for approval.

### **6-8 Launch Director and Range Safety Officer**

**6-8.1** The LD or RSO may refuse to allow the launch, or static testing, of any rocket or rocket motor that they deem to be unsafe.

**6-8.2** The LD or RSO may require greater Safe Standoff Distances than specified in this code.

### **6-9 Recovery**

**6-9.1** A rocket shall be launched only if it contains a recovery system that is designed to return all parts of the rocket to the ground safely.

**6-9.2** Rockets that employ passive recovery (e.g. tumble recovery, aero-braking) need not employ an active recovery system.

## Minimum spectator and Participant Safe Distance Standoffs

Total Installed Impulse, N-s		Motor type	Non-Complex		Complex	
			feet	meters	feet	meters
0.01 to	160	High Power G or smaller	100	30	200	61
160.01	320	H	100	30	200	61
320.01	640	I	100	30	200	61
640.01	1280	J	100	30	200	61
1,280.01 to	2,560	K	200	61	300	91
2,560.01 to	5,120	L	300	92	500	152
5,120.01 to	10,240	M	500	153	1,000	305
10,240.01 to	20,480	N	1,000	305	1,500	457
20,480.01 to	40,960	O	1,500	457	2,000	610

### 7 Referenced Publications

The following documents or portions thereof are referenced within this code. The edition indicated for each reference is the current edition as of the date of the NFPA issuance of this document.

#### 7-1 NFPA Publications.

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

NFPA 1122, Code for Model Rocketry.

NFPA 1125, Code for the Manufacture of Model Rocket Motors.

NFPA 1127, Code for High Power Rocketry

#### 7-2 Government Publications.

Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402.

Federal Aviation Administration Regulations, from the Code of Federal Regulations.  
Federal

Hazardous Substances Act, from the United States Code (re. Airspace Control)

### **7-3 TRA Publications.**

Tripoli Rocketry Association, Inc., P. O. Box 87, Bellevue NE 68005.

Articles of Incorporation and Bylaws

Tripoli Motor Testing Committee (TMT), Testing Policies

### **Appendix A - Additional Tripoli Rulings**

**A-1** NFPA 1127 was adopted by the Tripoli Board of Directors as the Tripoli Safety Code. (*Tripoli Report*, April 1994, Tripoli Board Minutes, New Orleans, 21 January 1994, Motion 13.)

**A-2** All Tripoli members who participate in Association activities shall follow the Tripoli Certification Standards.

**A-3** Any Board action(s) with regard to safety, made previous to or after publication of this document, shall be a part of the Tripoli Safety Code.

**A-4** Increased descent rates for rocket activities conducted at the Black Rock Desert venue are acceptable if needed to insure a controlled descent to remain inside the FAA approved Dispersion Area.

**A-5** A rocket motor shall not be ignited by using:

- a. A switch that uses mercury.
- b. "Pressure roller" switches

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