

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. ~~It is not a perfect standard, but adequate.~~ This document sets minimum requirements, if followed, ~~will standards, intended to~~ preserve the hobby in a safe environment ~~for all who participate and for spectators. Tripoli's Prefectures and other launch sponsors should be aware that wisdom should dictate what is safe and what is not at each launch site. With.~~ Using this standard Code as the minimum, it will be your responsibility to regulate your own launches within reason. ~~You should be cautious not to over-restrict safely for the activity. Our members, who sometimes travel great distances to attend launches, will expect this~~ conditions of each launch site. This Safety Code ~~to shall~~ be the standard at all Tripoli ~~sanctioned launches~~ Sanctioned Launches.

~~This version of the safety code will appear much terser than prior versions. This version is intended to~~ augment The Tripoli High-Power Safety Code supplements NFPA 1127 Code for High Power Rocketry with codes sections that are specific to Tripoli. The foundation of the Tripoli High Power Safety Code is NFPA 1127 ~~as that has been adopted by many Authorities Having Jurisdiction and define the minimum set of codes required. Tripoli codes cannot relax NFPA codes; we can only add codes that are intended to increase safety at our sanctioned launches.~~

1 General Requirements

1-1 Scope

1-1.1 ~~1-1.1~~ This code shall ~~apply to set practices for~~ safe operation of High Power rocket launches. It will also address some aspects of safe rocket design, and construction, ~~as well as 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 ~~1-2.1~~ The purpose of this code shall be to establish guidelines for reasonably safe operation of high power rocket rockets at Tripoli ~~sanctioned/insured launches;~~ both "commercial" as well as Research (covered in a separate code). 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

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NAR only. Note: some types of TRA membership do not include insurance (e.g. Associate, and Honorary members).

~~Adult Flier: A TRA member or a member of an approved, insured rocketry organization~~An Insured Flier that is 18 years old or older.

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~~High Power Rocketry Flier (HPR Flier): A TRA member or a member of an approved, insured rocketry organization that~~An Adult Flier that is 18 years old or older and is certified to fly High Power rockets at their certification level.

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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.

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~~Named Insured: Individuals that are not Tripoli Members but are members of groups that have been submitted to, and approved by the Tripoli~~Insurance Liaison.

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Participants. Persons that are either:

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- HPR Fliers.
- Model Rocket Fliers.
- Invited Guests of Fliers~~Fliers.~~
- ~~Spectators. General population of non fliers, and non invited guests.~~

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Range Safety Officer (RSO). A Level 2 or Level 3 flier ~~whose responsibility and duty during~~who has the authority to ensure the safe operation of high power rockets is to confirm a rocket's compliance with the applicable provisions of this code, be confident 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.~~range.~~

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Sanctioned Launch. ~~Also called~~A sanctioned launch is a Tripoli Insured Launch. Any launch of a rocket that meets Sanctioned Launch shall meet ALL of the following ~~constraints~~requirements:

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

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Shall. Indicates a mandatory requirement.

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

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

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Spectator Area. An area designated where spectators view a ~~high-power~~ 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.

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Requirements for High Power Rocket Operation

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

~~a.~~ This code; and NFPA 1127;

~~b.~~ *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); ~~and~~

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

~~d.~~ Landowner permission.

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3 **Legality**

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

Insurance

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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.

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

2-45-1 HPR Fliers may access and conduct flights from the High-Power Launch Area and/or Model Rocket Launch Area.

2-25-2 Non-Tripoli Members age 18 and over ~~that who~~ are students of an accredited educational institution may participate in joint projects with Tripoli members. ~~These individuals are allowed in the High Power Launch Area if escorted by an HPR Flier or Model Rocket Launch Area if escorted by an Adult Flier. The maximum number of nonmember participants shall not exceed five (5) per supervising flier.~~

5-2.1 ~~Non Tripoli Members that are members of a Named Insured Group may participate in joint projects with Tripoli members.~~ These individuals are only allowed in the High-Power Launch Area if escorted while supervised by an HPR Flier ~~or~~.

5-2.2 They are only allowed in the Model Rocket Launch Area if escorted while supervised by an Adult Flier.

2-35-2.3 The maximum number of nonmember participants shall not exceed five (5) per supervising flier.

5-3 Tripoli Junior Members ~~that who~~ have successfully completed the ~~Tripoli Mentoring Program Training~~ TMP may access and conduct flights from the High-Power Launch Area while under the direct supervision of a Tripoli ~~Senior member~~ HPR Flier in accordance with the rules of the ~~Tripoli Mentored Flying program- TMP.~~

2-45-3.1 The ~~Tripoli Senior member may provide supervision for up to maximum~~ number of TMP participants shall not exceed five (5) individuals that have successfully completed the Tripoli Mentoring Program Training at a time in the High Power Launch Area per supervising flier.

2-55-4 Children younger than 18 years of age may conduct flights from the Model Rocket Launch Area under the direction of an Adult Flier.

2-6 **Attendance by Invited Guests and Spectators**

February 2016 Tripoli Rocketry Association – High Power Safety Code

April 2017 – Page: 4

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~~2-6.15-5~~ 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.

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~~2-6.2~~ An Invited Guest may be allowed in the High Power Launch Area if escorted by a HPR Flier. A HPR Flier may escort and be accompanied by not more than five (5) non HPR fliers in the High Power Launch Area. The HPR flier escort is required to monitor the actions of the escorted non HPR fliers, and the escort is fully responsible for those actions and for the safety of those escorted.

~~5-6~~ Spectators, who are not invited guests, shall confine themselves to the only permitted in the spectator areas as designated by the RSO and shall area(s); they are not be present permitted in the High-Power Launch Area or Model Rocket Launch Area.

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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

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

2-6.3

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 3-1 NFPA Publications.

National Fire Protection Association, 11 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 3-2 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)

February 2016 Tripoli Rocketry Association – High Power Safety Code

April 2017 – Page: 7

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7-3 3-3 TRA Publications.

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

Articles of Incorporation and Bylaws

High Power Rocketry Safety Code

Tripoli Motor Testing Committee (TMT), Testing Policies

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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.) ~~Since this adoption, the code has gone through some revisions. Such is the way with codes — they are constantly undergoing change to improve and update them when safety prompts, or when the federal regulations change or are reinterpreted~~

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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