



Estes-Cox Corporation

1295 H Street • PO Box 227 • Penrose, CO 81240-0227
Phone: 719.372.6565 • Fax: 719.372.3217

May 30, 2012

Via email to: canmet-erd@nrca.gc.ca

Telephone: 613-948-5170

Facsimile: 613-948-5195

Christopher G. Watson
Chief Inspector of Explosives
Explosives Regulatory Division
Natural Resources Canada
1431 Merivale Road
Ottawa, Ontario K1A 0G1 Canada

Subject: Proposed Explosives Regulations published in the Canada Gazette, Part I, March 17, 2012

Dear Chief Inspector Watson,

The purpose of this letter is to provide comments concerning the proposed explosives regulations published in the Canada Gazette, Part I, March 17, 2012.

To begin, we wish to extend a thank you to the personnel at the Explosives Regulatory Division for the very comprehensive and easy-to-follow 20 part revision of the Explosives Regulations.

We are especially appreciative and pleased that sport rocketry is to be regulated as a separate entity and has been removed from fireworks regulations.

Additional technical comments are enclosed. Again, a special thanks to all for your work and for giving interested parties the opportunity to review the revisions and comment.

Kind Regards,

Mary Roberts
Manager,
Estes-Cox Corp. Technical Services
Member,
NFPA Pyrotechnics Committee



Technical comments are as follows:

Part 1, Div. 6. Add a definition:

“In-transit” means *being moved into, through and out of Canada.*

Substantiation: Because Part 4 provides requirements for “in-transit” permits for explosives, a definition of “in-transit” as used in the regulations would be helpful to define when an “in-transit” permit is necessary. Otherwise the broader definition found in dictionaries seem to make Part 4 applicable to ALL explosives being transported into, within, or out of Canada

Part 3, Div. 28. (n) Recommend revising as follows:

(n) The safety instructions, in both English and French, that will accompany the explosive, including procedures for preventing accidents when handling, storing, using or destroying the explosive and the procedures to follow if the explosive is lost or stolen, when appropriate and required; and

Substantiation: If 25 kg of TNT are stolen from a magazine, it should be reported to authorities immediately due to its destructive potential but if a rocket hobbyist loses a few model rocket igniters or a small model rocket motor in the grass while at the launch site, it should not require reporting. Model rocket manufacturers generally do not provide reporting information on packaging or in instructions. Warnings are provided on motor casings in case an individual finds a model rocket motor. Instructions for disposal are provided on the motor or in its instructions.

Part 3, Div. 30. (g) Suggest revising as follows:

(g) The method to be used to destroy any of the explosive that is not used or kept in one’s possession when leaving Canada.

Substantiation: The revision would provide the option for rocket hobbyists participating in an international competition in Canada to take any remaining model or high power rocket motors back to their country with them rather than destroying them.

Part 4, Div. 45 Table, Item 1. Suggest revision as follows:

1. Model rocket motors that each have a maximum total impulse of 160 Newton-seconds (NFPA alpha designations A to G as indicated on the motor or its packaging.)

Substantiation: The exemption would cover all motors defined as “model rocket motors”, allowing model rocket hobbyists to import in their possession a small number of F or G size model rocket motors for their personal use without having to apply for a permit.

Part 4, Div. 47 (4)(a) Recommend revising as follows:



(a) the words “Explosives/Explosifs”, “Fireworks/Pièces pyrotechniques’ or Pyrotechnics/Pièces pyrotechniques” or other type of explosive as the case may be, on the outer packaging and any inner packaging; and

Substantiation: This would eliminate confusion in transportation as model and high power rocket motors are classified as explosives and must bear the “Explosives” dangerous goods label on the outer packaging as well as the appropriate Proper Shipping Name, “Articles Pyrotechnic”, “Cartridges, Power Device” or “Articles Explosive n.o.s.” plus ID or UN number as classified by the Competent Authority of the country of origin.

The display packaging for model and high power rocket motors describes the explosives as such and as required by NFPA Codes. This description also provides their intended use as a motor for a model or high power rocket. Adding the words, explosives, fireworks or pyrotechnics may confuse consumers with regard to their intended use.

Part 4, Div. 49 (1)(a) Recommend revising as follows:

(a) the words “Explosives/Explosifs”, “Fireworks/Pièces pyrotechniques’ or Pyrotechnics/Pièces pyrotechniques” or other type of explosive as the case may be, on the outer packaging and any inner packaging; and

Substantiation: This would eliminate confusion in transportation as model and high power rocket motors are classified as explosives and must bear the “Explosives” dangerous goods label on the outer packaging as well as the appropriate Proper Shipping Name and UN or ID Number as classified by the Competent Authority of Canada.

The display packaging for model and high power rocket motors describes the explosives as such and as required by NFPA Code 1125. This description also provides their intended use as a motor for a model or high power rocket.

Part 6, Div. 145 (1)(f) Recommend revising as follows:

(f) If the site will be a distribution establishment, an indication of whether explosives will be repackaged there and whether the repackaging will involve only outer packaging or both inner packaging and outer packaging.

Substantiation: Opening outer packs of model and high power rocket motors and repackaging of smaller quantities into new outer packs without modification or changes to inner packagings is necessary as a distributor or retailer and should not merit additional concern. At the business of a hobby wholesaler, the repackaging of inner packs of model rocket motors will be a very small portion of their time requirements with regard to their overall product lines.

Part 7, Div. 167 (2)(a) Recommend revising as follows:

(a) the theft, attempted theft or loss of an explosive, when appropriate and required;

Substantiation: If 25 kg TNT are stolen, it should be reported to authorities immediately due to its destructive potential but the loss or theft of a small number of packages of model



rocket igniters or model rocket motors should not require reporting. Model rocket manufacturers generally do not provide reporting information on packaging or in instructions. Warnings are provided on motor casings in case an individual finds a model rocket motor. Instructions for disposal are provided on the motor or in its instructions.

Part 7, Div. 167 (3) Recommend revising as follows:

(3) The holder must provide the Chief Inspector of Explosives with a detailed follow-up report about the incident when appropriate and required as soon as the circumstances permit. The report must include the likely cause of the incident and the steps that the holder will take to prevent such an incident from happening again.

Substantiation: If 25 kg of TNT are stolen, the theft should be reported to authorities immediately due to TNT's destructive potential but the loss or theft of a small number of packages of model rocket igniters or model rocket motors should not require reporting. Likewise detailed follow-up reports may not be necessary for other incidents involving model rocket motors and igniters such as a spill.

Part 7, Div. 168 Recommend adding (d)

(d) are reduced to a quantity not requiring storage in a magazine.

Substantiation: If one has only a few kg of model rocket motors and model rocket igniters left in their inventory, it should not have to be destroyed, placed in another magazine or returned to the person from whom they were purchased.

Part 9, Div. 191 (8) Recommend revising as follows:

(8) The carrier must ensure that the vehicle that contains explosives is equipped with one fire extinguisher having a rating of 10 B:C or more or two fire extinguishers that have a rating of at least 4-A ; 40-B:C and are easily accessible.

Substantiation: Vehicles originating in the US and used to transport quantities of hazardous materials (dangerous goods) requiring placarding are required to have only one fire extinguisher as noted in the US DOT FMCSA regulation reprinted below:

49CFR Subpart H - Emergency equipment

§ 393.95 Emergency equipment on all power units.

Each truck, truck tractor, and bus (except those towed in driveaway-towaway operations) must be equipped as follows: (a) Fire **extinguishers**—(1) Minimum ratings. (i) A power unit that is used to transport hazardous materials in a quantity that requires placarding (See §177.823 of this title) must be equipped with a fire **extinguisher** having an Underwriters' Laboratories rating of 10 B:C or more.

Part 9, Div. 192 (3) and (a) Recommend revising as follows:

(3) The shipper and carrier must ensure that ~~things other than explosives~~ other dangerous goods are not transported with explosives unless



Estes-Cox Corporation

1295 H Street • PO Box 227 • Penrose, CO 81240-0227
Phone: 719.372.6565 • Fax: 719.372.3217

(a) in the case of a vehicle that contains no more than 2,000 kg of explosives, the things dangerous goods are stowed or separated from, the explosives so as to minimize the likelihood of an ignition; and

Substantiation: Manufacturers have historically offered model rocket starter sets which contain the parts to construct a rocket, launch equipment and launch supplies. The launch supplies are generally comprised of a small amount of recovery wadding, two or three model rocket motors and igniters. Further shipments of model rocket motors and igniters are generally part of a shipment comprised of complete model rocket launch sets, model rockets, model rocket kits, launch equipment and other accessories such as rocket-building tools, altitude tracking devices, etc. The non-hazardous components of a model rocket and launch equipment will not cause damage to or ignition of the model rocket motors or igniters.

Part 15 Div. 310. (1) Recommend revising as follows:

(1) A distributor may acquire, store and sell rocket motors, reloading kits and igniters for sale to retailers and users. ~~if they hold a licence.~~ A distributor who acquires rocket motors, reloading kits or igniters must comply with this Division.

Substantiation: A distributor of model rocket products will often be a full-line hobby distributor carrying thousands of hobby items. The distributor may not carry large quantities of model rocket motors, reloading kits and model rocket igniters. And some hobby distributors will not carry model rocket products if they must have a magazine.

Our industry is not aware of any storage incident involving model rocket motors, reloading kits or igniters that would be cause for the additional storage limitations in the proposed regulations. We understand that currently magazine storage is not required for less than 1000 kg.

Part 15 Div. 311. (1) Recommend inserting material as follows and renumber current Divisions (1) and (2) as (2) and (3).

(1) A seller that has inventory of model rocket motors, reloading kits and igniters in excess of 1,000 kg must apply for a magazine licence and their inventory of model rocket motors, reloading kits and igniters must be stored in the magazine specified in their licence. Quantities not exceeding 1000 kg must be kept in a specified storage unit or a warehouse area away from other hazardous materials and with a working fire-protection sprinkler system.

Substantiation: A distributor of model rocket products will often be a full-line hobby distributor carrying thousands of hobby items. The distributor may not carry large quantities of model rocket motors, reloading kits and model rocket igniters. And some hobby distributors will not carry model rocket products if they must have a magazine.

A retailer with many outlets, however, may have large quantities of model rocket motors, reloading kits and igniters in inventory in distribution centers.



Our industry is not aware of any storage incident involving model rocket motors, reloading kits or igniters that would be cause for the additional storage limitations in the proposed regulations. We understand that currently magazine storage is not required for less than 1000 kg.

Part 15 Div. 312 (2) Recommend revising as follows:

(2) In the case of a sales establishment that is not a dwelling, no more than 25 kg of rocket motors, and reloading kits and model rocket igniters (combined quantity) ~~and no more than 300 igniters~~ may be displayed for sale.

Substantiation: Model rocket manufacturers generally package uninstalled model rocket igniters with model rocket motors often packaging more igniters than motors in case the consumer experiences a misfire. A package of three model rocket motors may contain four model rocket igniters. If the display of model rocket motors is limited by the number of igniters that would limit the number of model rocket motor packs on display and require the seller to keep perpetual count of igniters in inventory.

Part 15 Div. 313 (c) Recommend revising as follows:

(c) it must be designed so that it ~~prevents any shifting of~~ damage to the rocket motors, reloading kits or igniters during handling or transportation.

Substantiation: Model rocket manufacturers often package model rocket motors and model rocket igniters in inner packaging of plastic bags and/or fiberboard boxes that offer the product protection from damage but may allow some minimal shifting of product in its inner packaging. Both types of packaging are specified and allowed as inner packaging by the UN Model Regulations, US Department of Transportation Regulations and by Canada's Transport of Dangerous Goods Regulations.

Part 15 Div. 314 (1) Recommend revising as follows:

(1) ~~No more than 200 kg of Rocket motors, and reloading kits and model rocket igniters (combined quantity) and no more than 2,500 igniters may be stored at any one time including those that are not~~ displayed for sale should be stored as required in Div. 311. (1)

Substantiation: Model rocket manufacturers generally package uninstalled model rocket igniters with model rocket motors often packaging more igniters than motors in case the consumer experiences a misfire. A package of three model rocket motors may contain four model rocket igniters. The number of model rocket motors would be limited by the number of igniters and require the seller to keep perpetual count of igniters in inventory. Tracking will be complex due to the varying numbers of igniters per motor package and the various forms of motor and igniter packaging.

A retailer with many outlets will have small quantities on display. However, the retailer may have larger quantities of model rocket motors, reloading kits and igniters in inventory in distribution centers.



Our industry is not aware of any storage incident involving model rocket motors, reloading kits or igniters that would be cause for the additional storage limitations in the proposed regulations. We understand that currently magazine storage is not required for less than 1000 kg.

Part 15 Div. 314 (3) Recommend revising as follows:

(3) A model rocket motor in which an ~~motor~~ igniter has been installed must not be stored.

Substantiation: A model rocket igniter should only be installed in a model rocket motor when preparing to launch and during launch. Model rocket motors are difficult to ignite and not having the igniter installed further reduces any probability of unintended ignition during storage and transportation. US DOT requires igniters be uninstalled and separated from motors via means of inner packaging methods during transportation. This instruction was also recommended by CERL following testing of model rocket motors and igniters.

Part 15 Div. 314 (4) Recommend revising as follows:

(4) Rocket motors, reloading kits and igniters must ~~not be exposed to heat or dampness that could cause them to deteriorate~~ be kept in a cool dry environment and should not be stored at temperatures below freezing or in excess of 38°C (100° F) or exposed to excessive humidity that may cause them to fail when used.

Substantiation: Model rocket motors, reloading kits and igniters have an indefinite shelf life but are made with materials that have differing expansion ratios. This does not cause deterioration of the pyrotechnic content. However, when frozen and thawed repeatedly the propellant may separate from the casing which can cause an uncontrolled burn when used. Paper casings may swell and clay nozzles crumble when exposed to excessive humidity making them unusable or subject to failure when used.

Part 15 Div. 315 (1) Recommend revising as follows:

(1) When rocket motors, reloading kits or igniters are stored in a dwelling, they must be stored away from sleeping quarters, flammable substances and sources of ignition, in a manner that protects them from theft and ensures that access to them is limited to people authorized by the retailer.

Substantiation: The 54 years plus history of model rocketry has shown that model rocket motors do not ignite spontaneously or as a result of static electricity, friction or even severe impact. History has shown that the only time a model rocket motor ignites is when ignited intentionally or unintentionally by a person or when it becomes involved in a fire created by another source. Therefore the ignition of a model rocket motor in storage in a dwelling is most likely to be caused by the dwelling being on fire. Fire personnel attempting rescues of children and others could be hampered by the storage of model rocket motors in sleeping quarters. Igniters have so little pyrogen, they are of little concern in a fire situation.

Part 15 Div. 315 (2)(f) Recommend revising as follows:



(f) Only rocket motors, reloading kits and igniters and non-hazardous materials such as rockets and the components of rockets and their packaging may be stored in the storage unit.

Substantiation: Manufacturers have historically offered model rocket starter sets which contain the parts to construct a rocket, launch equipment and launch supplies. The launch supplies are generally comprised of a small amount of recovery wadding, two or three model rocket motors and igniters. The non-hazardous components of a model rocket and launch equipment will not cause damage to or ignition of the model rocket motors or igniters. The additional non-hazardous material may actually reduce possibility of cross-ignition if present in a storage unit. It is unlikely the distributor, retailer or consumer will store non-hazardous material in the storage unit if it does not contain model rocket motors and igniters.

Part 15 Div. 318 Recommend revising as follows:

318. A seller who sells rocket motors or reloading kits ~~or igniters~~ to a user must offer the user either a copy of the table at the end of the Part or a document that includes ~~the same~~ equivalent information if it is not included with the motors or reloading kits.

Substantiation: Model rocket manufacturers have historically included with their model rocket motor or reloading kits, either the Model Rocket Safety Code of the Canadian Association of Rocketry or the National Association of Rocketry based in the U. S. The information in both Codes is generally equivalent though not exactly the same as the material in the table in Part 15. However, a bag of spare igniters usually does not have sufficient space to include a copy of the Model Rocket Safety Code.

Part 15 Div. 319 (2) Recommend revising as follows:

(2) A user who is at least 12 years old may acquire and store model rocket motors with an impulse that does not exceed ~~40~~ 80 Newton-seconds and igniters ~~without a licence~~. A user who acquires such motors or igniters must comply with this Division.

Substantiation: Users 12 years of age have been able to purchase and use model rocket igniters and motors with an impulse that does not exceed 80 Newton-seconds for many years. Those 16 years of age are able to drive vehicles with far greater weight and power. Nor is the industry aware of any incident that would warrant reducing the impulse to 40 Newton-seconds. Reducing the total impulse available to those under 18 would further restrict their ability to enjoy some of the facets of the hobby such as egg-lofting, radio-control boost glide and more. This may also restrict their ability to participate in some competitions on both the local and even international levels.

The storage requirements outlined Div. 321 and Div. 322 detail quantities requiring a storage license making "without a licence" unnecessary. The storage of more than 6 model rocket motors by one 12 years of age as restricted by Div. 321 (2) will not create more hazard in a dwelling than storage of more than 6 model rocket motors by one 18 years of age.

Part 15 Div. 321 (1) Recommend revising as follows:



Estes-Cox Corporation

1295 H Street • PO Box 227 • Penrose, CO 81240-0227
Phone: 719.372.6565 • Fax: 719.372.3217

(1) No more than 200 kg of rocket motors, ~~and reloading kits~~ and model rocket igniters (combined quantity) ~~and no more than 2,500 igniters~~ may be stored at any one time. If high-power rocket motors or reloading kits or igniters for high-power rocket motors are stored with model rocket motors or reloading kits, the combined quantity must not exceed 200 kg. ~~If igniters for high-power rocket motors are stored with igniters for model rocket motors, the combined quantity must not exceed 2,500.~~

Substantiation: Manufacturers often package uninstalled rocket motor igniters with model and high-power rocket motors. In many cases an extra igniter is included. Therefore the number of model and high-power rocket motors could be limited by the number of igniters and not the mass of the motors. Igniters used for the ignition of model and high power rocket motors generally do not create a large hazard due to the very small amounts of pyrogen present. Attempting to keep count of igniters in quantities up to 2500 would be somewhat complex due to the varying numbers of igniters per motor package and the various forms of motor and igniter packaging.

Part 15 Div. 321 (2) Recommend deletion and renumbering (3) and (4) as (2) and (3).

~~(2) A user who is less than 18 years old may store no more than 6 single use rocket motors with an impulse that does not exceed 40 newton-seconds, and no more than 10 igniters.~~

Substantiation: Model rocket hobbyists 12 years of age and older have been able to purchase model rocket motors and igniters without concern for storage limitations in most instances for many years. It is estimated by the industry that as many as 50% of hobbyists are less than 18 years of age. These young hobbyists have established an excellent record of safety in carrying out their model rocketry activities.

The industry and hobby associations are not aware of previous storage requirements that limited storage of model rocket motors to such a small number for an individual under 18 years of age. Nor is industry aware of any incidents that would warrant such an overly restrictive storage limitation.

The storage limitation also places severe restrictions on the purchasing of model rocket motors and igniters by those under 18 years of age. Many students as young as those attending middle school conduct model rocket altitude or flight recovery system experiments for their school science fair projects. Limiting their purchase and storage to six model rocket motors would make conducting such a science fair experiment difficult at minimum.

A package of Estes mini engines contains 4 motors and 4 igniters. This limitation would prevent the purchase of a second package of motors of sizes up through D size. A package of Estes B, C or D size model rocket motors contains 3 motors and 3 igniters. If the individual under 18 purchases two 3-packs of motors with igniters, they would be unable to purchase any extra igniters for those motors as they are only available separately in 6-packs. Limiting the purchase of and storage of model rocket motors and igniters to six and ten respectively is unwarranted and not justified. The storage of more than 6 model rocket motors by one 12 years of age as restricted by Div. 321 (2) will not



Estes-Cox Corporation

1295 H Street • PO Box 227 • Penrose, CO 81240-0227
Phone: 719.372.6565 • Fax: 719.372.3217

create more hazard in a dwelling than storage of more than 6 model rocket motors by one 18 years of age.

Users 12 years of age have been able to purchase and use model rocket igniters and motors with an impulse that does not exceed 80 Newton-seconds for many years. The industry and hobby associations are not aware of any incident that would warrant reducing the impulse to 40 Newton-seconds. Reducing the total impulse available to those under 18 would further restrict their ability to enjoy some of the facets of the hobby such as egg-lifting, radio-control boost glide and more. This may also restrict their ability to participate in some competitions on both the local and even international levels. Those 16 years of age are considered competent to handle and drive vehicles with far greater weight and power.

Part 15 Div. 321 (4) Recommend revising as follows:

(4) A model rocket motor in which the ~~motor~~ igniter has been installed must not be stored.

Substantiation: A model rocket igniter should only be installed in a model rocket motor when preparing to launch and during launch. Model rocket motors are difficult to ignite and not having the igniter installed further reduces any probability of unintended ignition during storage and transportation. US DOT requires igniters be uninstalled and separated from motors via means of inner packaging methods during transportation. This instruction was also recommended by CERL following testing of model rocket motors and igniters.

Part 15 Div. 322 (1) Recommend revising as follows:

(1) When rocket motors, reloading kits or igniters are stored in a dwelling, they must be stored away from sleeping quarters, flammable substances and sources of ignition, in a manner that protects them from theft and ensures that access to them is limited to people authorized by the user.

Substantiation: The 54 years plus history of model rocketry has shown that model rocket motors do not ignite spontaneously or as a result of static electricity, friction or even severe impact. History has shown that the only time a model rocket motor ignites is when ignited intentionally or unintentionally by a person or when it becomes involved in a fire created by another source. Therefore the ignition of a model rocket motor in storage in a dwelling is most likely to be caused by the dwelling being on fire. Fire personnel attempting rescues of children and others could be hampered by the storage of model rocket motors in sleeping quarters. Igniters have so little pyrogen, they are of little concern in a fire situation.

Part 15 Div. 322 (2)(f) Recommend revising as follows:

(f) Only high-power rocket motors, reloading kits ~~and~~ igniters and non-hazardous materials such as rockets and the components of rockets and their packaging may be stored in the storage unit.

Substantiation: Manufacturers have historically offered model rocket starter sets which contain the parts to construct a rocket, launch equipment and launch supplies. The launch