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Overview of Amendment #2

Amendment #2 to Explosives Regulations, 2013, recently appeared in Canada Gazette II. In this communication CNFA will point out some changes that affect the fireworks community and also explain the regulatory process in Canada and discuss a bit about risk. Members who have licences with the regulator ERD (Explosives Regulatory Division of Natural Resources Canada) should have an understanding of the Explosives Act and Regulations. The premise of this communication is that licencees are already familiar with ER, 2013, including amendment #1. CNFA strives to keep unlicensed stakeholders informed.

TDG (Transportation of Dangerous Goods of Transport Canada) newsletters contain a lot of good information. You can arrange for them to be emailed to you or you can find them on the Transport Canada website. The 12/2016 edition contained a description of the process for amending regulations. The following flow diagram is from the newsletter. The first step is a consultation on policy. CNFA has expressed some concerns regarding proper consultation. The following is extracted from a TBS (Treasure Board Secretariat) document.

“Departments and agencies should where possible take steps to develop and provide documents supporting the consultation efforts. Such documents are particularly helpful to stakeholders, to enable them to give meaningful input. Stakeholders should have all the information they need during the consultation process, including the supporting rationales, technical or scientific information, analyses performed, costs and benefits, trade-offs considered, risk assessment, potential impacts and consequences, and alternatives examined”.

There comes a time between block #1 and #3 when the draft regulations become Cabinet confidential so we find out the wording of an amendment when it appears in Canada Gazette I. We will be given a period of time to submit comments that are then reviewed by the regulators. When they appear in CG II they become the law of the land.

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Overview of Federal Regulatory Process

Refer to the ER, 2013, attached to this communication as it already incorporates the changes from amendment #2. The numbers below refer to the amendment number in the CG II November 14 amendment document (that document just includes what has been changed) only a portion of which applies to the fireworks community. If you would like to have ER, 2013, as it was before amendment #2 (after amendment #1) ask CNFA. The following is for the purpose of informing CNFA members and is not to be construed as the official explanation for changes.

2. subsection 26(3) was replaced – dealing with authorization
3. the portion of s.29 before paragraph (a) was replaced – dealing with authorization for a specified period
4. the portion of s. 30 before paragraph (a) was replaced; paragraphs 30 (d) and (e) were replaced; paragraph 30 (g) was replaced – dealing with application for authorization for a specified period
6. subsection 40(3) was replaced – dealing with duties related to a notice to recall an explosive
8. the table in s. 45 was replaced – this is the table when no permit is needed to import
9. subsection 47(4) was replaced – dealing with the exception for import permit for special event
15. 135.1(1) was added to s. 135 – stating that a person may assemble Christmas crackers; 135.1(2) added to s. 135 – dealing with requirements for assembling Christmas crackers
16. the portion of s. 168 before paragraph (a) replaced – dealing with destruction if you haven't applied for licence renewal
20. s. 186 was replaced – it is an overview of the transportation Part
21. the heading before s. 190(1) was changed – now Exemption of Certain Explosives

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22. the portion of subsection 190 before paragraph (a) was replaced
23. (3.1) was added after s. 191 (3) – dealing with fireworks in a towed vehicle
24. subsection 196(6) replaced – dealing with mechanical breakdown of a vehicle
26. subsection 201(1) replaced – dealing with delay due to accident or incident
27. additions to s. 203 – this deals with transportation by vessel and is covered in more detail later in this communication
33. definition of special effects pyrotechnics replaced
34. subsection 365(2) repealed – dealing with storing electric matches with other special effects pyrotechnics
35. subsection 388(3)(f) repealed – dealing with 3 letters of recommendation; paragraphs 388(4)(a) to (c) replaced
36. subsections 398(1) and (2) repealed – dealt with storage; subsection 398(3) replaced – storage at site of use;
37. s. 412 replaced – change from gross to net mass
38. paragraphs 420(b) and (c) replaced – dealing with record of sale
39. s. 426 replaced – dealing with storage by display supervisor in charge
40. paragraphs 432(d) and (e) replaced – dealing with fireworks display plan
41. subsection 434(5) replaced – dealing with handling
42 some changes to table to subsection 453(2)

Item 27 above refers to changes to s. 203. Essentially it introduces the concept of Quantitative Risk Assessment (QRA) for ports and software for QRA called IMESAFR. CNFA members holding a storage licence should be familiar with the concept of Quantity-Distance (QD). CNFA members who do not hold a licence should be familiar with the applicable part in ER, 2013, for example Part 16 Consumer Fireworks.

What is QD? – It is a system essentially based on the more explosives the greater the distance which ensures an acceptable level of protection for members of the public or non-involved persons, from an accidental explosion. Much of the QD philosophy is based on an appreciation of the damage from accidental explosions justified by a limited number of practical trials – "QD are based on trials, some wartime bombing damage and data from some accidental explosions. However, QD are subject to uncertainty owing to the variability of explosions and the uncertainty of available data."

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QD tables are consequence based assessments assuming that the probably of an explosion during the life of the facility is 100%. In risk terms P = 1. This is a very conservative approach.

The QD approach has been used world-wide for many years with various yet similar Tables of Distances, for example, American and NATO. Canadian tables are based on NATO (except for HD 1.4). Generally there is a table for each HD (for storage and manufacture of explosives Canada has replaced Hazard Division as used for transportation with Potential Effect (PE) – for our purposes the two are almost identical) . The use of QD is the primary method for siting explosives facilities in Canada.

What is QRA? - Risk can be defined as the harm that may result from an event combined with the probability that it will occur. No activity is risk free. QRA can be considered to be an extension of QD except that many more factors are taken into consideration.

From the IMESAFR User Manual: The IMESAFR model calculates risk in terms of the statistical expectation for loss of life from an explosives event. Three components are multiplied to estimate annual maximum probability of fatality, *Pf*: (1) the annual probability of an unintended explosives event, *Pe*, (2) the probability of a fatality given an event and exposure of a person, *Pf|e*, and (3) the average exposure of an individual, *Ep*. IMESAFR calculates individual risk using the following basic equation:

$Pf = Pe \times Pf|e \times Ep$ to determine individual risk

Group risk, or the expected fatalities, *Ef*, is then calculated by summing the individual risk of all exposed persons in the group:

$Ef = \Sigma (Pe \times Pf|e \times Ep)$ to determine group risk

IMESAFR is designed to calculate individual and group risk to two personnel categories:

Related people are associated with the explosives activity; *Unrelated* personnel are the general public (or are otherwise determined to be uninvolved with the explosives activity).

IME refers to individual risk of 10^-6 as the 'Golden Rule'. That is one in a million.

If you would like more information on any aspect of the above communication ask CNFA. We will get one of our technical consultants to answer you.

To learn more come to the CNFA members' meeting on March 28th in Toronto, Ontario. More details to come.