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MISCELLANEOUS DRAFT AMENDMENTS TO THE MODEL REGULATIONS
ON THE TRANSPORT OF DANGEROUS GOODS

Explosives

Creation of a New Entry
Ammonium Nitrate Emulsion Matrix

Transmitted by the Expert from Canada

1. France proposed, in document ST/SG/AC.10/1998/45, to add a new entry in Class 5 to cover emulsion matrices. The criteria by which a product could be assigned to this entry is proposed in the annex. The point of concern for Canada is the negative answer to the question "Is the substance an explosive according to paragraph 2.1.1.1 (item 4.2 in the annex).
2. Though some compositions with ingredients found in emulsion matrices may be properly assigned to Class 5, Canada believes that existing, commercial, emulsion matrices compositions should remain in Class 1.
3. Emulsion matrices of the type described in document ST/SG/AC.10/1998/45 from France have been used in Canada for over 20 year. The matrices can vary greatly in a number of critical properties that effect their sensitivity to explosion, for example, in density, in chemical composition, in oxygen balance, in degree of refinement. Changes in some of these properties can easily make the emulsion matrix sensitive to either a booster or to a detonator.

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4. The document from France described little of these properties and this could be crucial in affecting the behavior of such products, especially in conditions of confinement or exposure to high temperature as could be encountered in a fire in the hold of a ship, in a tunnel or even in a fiery crash.
 5. Canada has long felt the tests in the UN Tests and Criteria Manual do not apply very well to Explosives, Blasting, Type E. The tests in the Manual are usually performed at room temperature while these matrices are, for the most part, transported at fairly high temperatures. Furthermore, while the tests in the Manual work well for the more conventional explosives for which the tests were conceived, often ambiguous or false results are obtained with Explosives, Blasting, Type E. This can make the matrices appear to be insensitive to the stimuli prescribed in the tests in the Manual. Yet quite destructive consequences could result under more stringent conditions, conditions that occur regularly in manufacture or transport.
 6. The explosives properties of these matrices are not well known. To date, it is known that if they are ignited under pressure, such as in a pump, an explosion can result. In Canada in 1988, four people were killed by an explosion while pumping an emulsion matrix.
 7. In the early 1990's, an accident in Papua, New Guinea, resulted in a situation in which a large tank of emulsion matrix was caught in a fire in close proximity to a fuel oil tank which was ablaze. A severe explosion resulted with loss of life and large property damage.
 8. In the two incidents, the conditions to which the emulsion matrices were submitted were more severe than the criteria of testing for either Class 1 and especially the criteria for testing for Classes 4.1 and 5.1. Testing in Canada has shown some positive results in the prescribed Koenen Tests and especially in a scaled-up version of the Koenen Test using larger containers and fires.
 9. In conclusion, Canada feels that the document from France does not clearly define the properties of the emulsion matrices that would be covered in their proposals. This could lead to serious hazardous situations, especially since a fire in a Class 5.1 product would properly not lead to the same emergence response activity that would result from an incident involving a Class 1 product. This is one of the reasons why the Competent Authority in Canada has refused for the last 20 years to consider any other classification but Class 1 for emulsion matrices.
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