

**COMMITTEE OF EXPERTS ON THE TRANSPORT OF
DANGEROUS GOODS AND ON THE GLOBALLY
HARMONIZED SYSTEM OF CLASSIFICATION
AND LABELLING OF CHEMICALS**

Sub-Committee of Experts on the
Transport of Dangerous Goods

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ELECTRIC STORAGE SYSTEMS

Energy Storage Systems

Transmitted by the expert from the United States of America

1. During the previous biennium, the Sub-Committee discussed a number of issues related to energy storage systems including batteries of various types, fuel cell cartridges, and other similar articles. The Sub-Committee agreed to consider whether the provisions of the UN Model Regulations should be amended to more comprehensively and appropriately address such systems.

2. The issue is more complex than it may at first appear, because energy storage systems differ significantly and pose varying degrees of risk. For example, fuel cell cartridges generally present a chemical, rather than an electrical hazard. Batteries, depending on their chemistries and sizes, also pose differing risks. Furthermore, as technology evolves, new energy storage systems are continually developed which may not be covered by existing descriptions and provisions. Ultracapacitors, which are the subject of a paper presented at this session (2009/13), are an example of such a case.

3. Based on the diversity of these systems and their varying transport risks, addressing energy storage systems comprehensively within the Model Regulations will require a thorough review and open discussion. In order to properly address the many challenges that such an effort presents, it is proposed that a working group be convened to examine the issue and discuss a best way forward. While the present paper is not intended to propose definitive terms of reference, the following are presented as areas that the working group could consider as it develops its action plan for the biennium:

- **Classification:** The working group could discuss the various classifications for current energy storage systems, and the appropriateness of these classifications. Classification should be based on the risk posed in transport and on available data, and should ensure effective and appropriate hazard communication. The group could discuss for example whether these systems could be grouped together in such a way that the development of a new Class or new Divisions (for example new Divisions within Class 9) are warranted. The group could also discuss whether existing classifications are effective and ensure appropriate hazard communication and emergency response.

- **Risk:** The risks posed by the systems vary and should be considered simultaneously when discussing their classification. An emphasis should be placed on the actual risk in transportation and should take into account the types of dangerous goods, as well as their quantity and form. In addition variations in chemistry that affect transport considerations should be considered – for example the risks posed by lithium ion batteries differ from those posed by lithium metal batteries which was recognized by the Sub-Committee during the development of appropriate unique descriptions. Similarly, fuel cells contain various fuels posing differing chemical risks but generally do not pose an electrical hazard.

- **Transport Requirements:** Ultimately, the current transport requirements for the various systems could be reviewed and discussed. This discussion would be best reserved as a final step in the working group’s efforts, as the transport requirements will depend largely on the conclusions reached by the Sub-Committee with respect to the appropriate classification and risks posed by the various systems. To the extent possible, harmonization of transport requirements for energy systems of like risks should be achieved. In addition, in order to take into account the rapid evolution of new technologies, the requirements should be such that future systems are also covered to the greatest extent possible.

4. Several papers have been submitted for consideration at the current session relevant to this agenda item, including 2009/26 – “Consolidation of energy systems into new section(s) of the UN Model Regulations on the Transport of Dangerous Goods” presented by the US Fuel Cell Council (USFCC). It is believed that a thorough review and discussion in plenary that encompasses the above considerations as well as any other relevant areas of discussion identified by the Sub-Committee will assist in answering the questions posed in 2009/26 and will help to determine the most appropriate way forward for the Sub-Committee or for a working group, if the Sub-Committee decides to establish one.
