



Secretariat

Distr.
GENERAL

ST/SG/AC.10/C.3/2001/54
18 September 2001

ORIGINAL : ENGLISH

**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**
(Twentieth session, 3-12 December 2001,
agenda item 5 (b))

PACKAGINGS

Miscellaneous Proposals

Packaging of large lithium batteries

Transmitted by the Expert from the United States of America

Background

1. Packing Instruction P903 in the UN Recommendations prescribes the packing requirements for lithium batteries. Under the packing instruction, all batteries must be packed in UN tested, marked and certified packagings conforming to Packing Group II performance requirements. While such packaging is practical for smaller batteries, use of this type of packaging is not practical for large lithium batteries such as the type to be employed in electric and hybrid vehicle applications. By contrast, packing instructions applicable to other types of batteries (see, for example, Packing Instruction P801 applicable to batteries containing corrosive electrolyte (UN 2794, UN 2795 and UN 3028) and Packing Instruction P408 applicable to "Batteries containing sodium" (UN 3292)), permit the batteries to be carried unpacked or in protective enclosures (such as crates) not required to meet the UN packaging performance requirements.

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2. Lithium batteries when intended for use in vehicle propulsion may be transported as individual batteries (commonly referred to in the industry as "modules") - three or more of which are united to form a battery assembly when installed in the vehicle. A survey of international lithium battery manufacturers indicates that the smallest individual battery used as a battery assembly component would have a mass of 12 kg (Hitachi Shin-Kobe, Japan). Alternatively, three or more such batteries may be transported as a complete battery assembly (commonly referred to in the industry as a "battery pack"), as would be installed in a vehicle. In the survey of lithium battery manufacturers it was reported that the largest battery assembly would have a mass of 500 kg (SAFT, France). Individual batteries typically employ a strong, impact-resistant outer casing, and battery assemblies may be enclosed in a further impact-resistant casing.

3. The expert from the United States believes that, like other types of batteries, "large" lithium batteries should be authorized to be transported unpacked or in outer packagings or protective enclosures not required to meet the UN packaging performance requirements. The Sub-Committee is invited to consider the following proposal, which is based on packagings authorized in Packing Instructions P801 and P408 for other types of batteries.

Proposal

4. It is proposed that Packing Instruction P903 be amended by inserting the following additional paragraph following the statement "Packaging conforming to the packing group II performance level":

"In addition, batteries employing a strong, impact resistant outer casing and exceeding a gross mass of 12 kg, and assemblies of such batteries, may be packed in strong outer packagings, in protective enclosures (e.g., in fully enclosed or wooden slatted crates) or on pallets. Batteries shall be secured to prevent inadvertent movement, and the terminals shall not support the weight of other superimposed elements."
