



Economic Commission for Europe**Inland Transport Committee****Working Party on the Transport of Dangerous Goods****Joint Meeting of the RID Committee of Experts and the
Working Party on the Transport of Dangerous Goods**

Geneva, 21 September – 1 October 2021

Item 5 (b) of the provisional agenda

**Proposals for amendments to RID/ADR/ADN:
new proposals****Transport of electric energy systems containing lithium ion
batteries****Transmitted by the Government of Sweden^{*, **}***Summary*

Executive summary:	Clarify and develop appropriate transport provisions and conditions for the transport of electric energy systems containing lithium ion batteries by road and rail.
Action to be taken:	Insert suitable transport provisions for electric energy systems containing lithium ion batteries.

Introduction

1. Over the past few years, the use of mobile electric energy systems has increased significantly. This trend will likely continue and expand even more, especially considering global activities and the aim to phase out fossil fuels and shifting towards low-carbon power sources. The ambition and legislation put forward by the European Commission, described on ec.europa.eu/environment/topics/waste-and-recycling/batteries-and-accumulators_en, is one example of on-going actions to facilitate and accelerate this transition.

2. Mobile electric energy systems might be lithium batteries attached to the interior structure of containers. Furthermore, it might also be systems, fastened and secured on trailers, containing lithium ion batteries and other equipment necessary for its functioning. In some cases, there might be only one large lithium ion battery bolted on the trailer. The systems are used for example to provide power to electrified machines and construction site

* A/75/6 (Sect.20), para 20.51.

** Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2021/32.

sheds. They are often transported to be used at work sites and in work situations in line with the provisions in 1.1.3.1 (c). In the example in Figure 1 below, the energy system consists of six batteries with an individual capacity of 20 kWh, in total 120 kWh. The weight of the energy system without the trailer is approximately 3000 kg.

Figure 1



3. The question how these mobile electric energy systems should be classified has been brought up several times recently, and also if any exemption is applicable, such as the provisions in 1.1.3.7.

4. One possible solution is to use the existing UN 3536, lithium batteries installed in cargo transport unit and transport these systems more or less fully regulated. The definition of a cargo transport unit in Chapter 1.2 reads as follows:

“Cargo transport unit” means a vehicle, a wagon, a container, a tank-container, a portable tank or an MEGC;”

5. Special provision 389 is assigned to UN 3536 and it is stated that UN 3536 applies to cargo transport units in which lithium ion batteries or lithium metal batteries are installed and which are designed only to provide power external to the unit. However, special provision 389 only permits exemptions from marking and labelling requirements to the individually installed batteries in the cargo transport units. All other requirements are still applicable, e.g. dangerous goods documentation, equipment on board and driver training. In Sweden's view, UN 3536 would be the most appropriate entry, because UN 3171, battery powered vehicle, is as currently defined, not the appropriate entry for these systems.

6. If the systems are transported by enterprises which is ancillary to their main activity, it is impossible to use 1.1.3.1 (c) as currently written. This paragraph limits the packaging sizes and also contains limits in accordance with 1.1.3.6. UN 3536 is not assigned to any transport category, and, thus, 1.1.3.6 is not applicable.

7. Furthermore, it may be discussed if 1.1.3.7 could be used or not. The question is if the electric energy system is “in use” during transport or if it is considered transported as cargo (“in transport”). Sweden's interpretation for the time being is that the system might not be considered “in use” and hence 1.1.3.7 would not be applicable.

8. Sweden believes that it should be possible for companies to transport electric energy storage systems according to 1.1.3.1 (c) in work situations, in the same way as for other types of dangerous goods, e.g. flammable liquids. To solve this, Sweden proposes two alternate options to amend 1.1.3.1 (c). In the first option, Sweden proposes to insert a new sentence for electric energy systems with an upper limit for the total energy content of 100 kWh. This energy content limit is based on the energy content in batteries used in Tesla cars, https://en.wikipedia.org/wiki/Tesla_Model_S#Battery, and other values can certainly be discussed.

9. In the second option, Sweden proposes to introduce a limit for the total weight of the batteries instead. The proposed maximum mass is 667 kg. This value originates from a specific energy of 150 Wh/kg average value¹ for a battery (see setis.ec.europa.eu/transforming-european-energy-system-through-innovation-2016_en).

Sweden is aware that different batteries have different values, but Sweden thinks 150 Wh/kg is a reasonable average limit. The limit for the batteries in kilograms will be 667 kg (100 kWh / 150 Wh/kg).

10. Furthermore, to facilitate the situation, Sweden also believes that some exemptions for land transport should be included for UN 3536, similar to special provision 363 assigned to engines and machinery (UN 3528, 3529, 3530) or special provision 666 assigned to UN 3171. Sweden proposes that a new special provision is introduced for UN 3536 in RID/ADR where all applicable provisions for road and rail transport are stated. Sweden's suggestion is to require that cargo transport units assigned to UN 3536 shall be marked with orange-coloured plates and placards when the total energy content is more than 100 kWh (could be further discussed). The specific requirements concerning compliance with 2.2.9.1.7 and load securing currently in special provision 389 should also apply and are thus transferred from special provision 389 to the new special provision. As a consequence, special provision 389 could be deleted in ADR/RID. No other provisions should be applicable.

11. Since Sweden believes that this type of transport is more common on land and there is an urgent need to develop relevant provisions which need not be as stringent as for sea transport, Sweden thinks this discussion should be held by the Joint Meeting rather than the UN Sub-Committee of experts on the transport of dangerous goods. For multimodal transport Sweden believes the current special provision 389 in the UN Model Regulations (21st revised edition) is sufficiently drafted.

Proposals

Proposal 1

12. Amend 1.1.3.1 (c) to read as below (new text in **bold**). Two different options are placed in square brackets (* = option 1 and ** = option 2):

“(c) The carriage undertaken by enterprises which is ancillary to their main activity, such as deliveries to or returns from building or civil engineering sites, or in relation to surveying, repairs and maintenance, in quantities of not more than 450 litres per packaging, including intermediate bulk containers (IBCs) and large packagings, and within the maximum quantities specified in 1.1.3.6. **[For UN 3536 the maximum total energy content of the batteries is 100 kWh.*] [For UN 3536 the maximum mass of the batteries is 667 kg.**]** Measures shall be taken to prevent any leakage of contents in normal conditions of carriage. These exemptions do not apply to Class 7.

Carriage undertaken by such enterprises for their supply or external or internal distribution does not fall within the scope of this exemption;”

Proposal 2

13. In Chapter 3.3 insert a new special provision to read as follows:

“6XX This entry only applies to cargo transport units in which lithium ion batteries or lithium metal batteries are installed and which are designed only to provide power external to the unit. No other requirements of ADR/RID apply except for the following provisions:

¹ This value is confirmed by RECHARGE (The advanced rechargeable and lithium batteries association in Europe).

The lithium batteries shall meet the provisions of 2.2.9.1.7 (a) to (g) and contain the necessary systems to prevent overcharge and over discharge between the batteries.

The batteries shall be securely attached to the interior structure of the cargo transport unit (e.g., by means of placement in racks, cabinets, etc.) in such a manner as to prevent short circuits, accidental operation, and significant movement relative to the cargo transport unit under the shocks, loadings and vibrations normally incident to carriage.

Dangerous goods necessary for the safe and proper operation of the cargo transport unit (e.g., fire extinguishing systems and air conditioning systems), shall be properly secured to or installed in the cargo transport unit and are not otherwise subject to ADR/RID. Dangerous goods not necessary for the safe and proper operation of the cargo transport unit shall not be carried within the cargo transport unit.

The batteries inside the cargo transport unit are not subject to marking or labelling requirements. Where the maximum total energy content is above 100 kWh, the cargo transport unit shall bear orange-coloured plates in accordance with 5.3.2.2 and placards in accordance with 5.3.1.1 on two opposing sides.”

Consequential amendments:

14. Amend the first Note in 2.2.9.1.7 to read as follows:

“NOTE: For UN 3536 LITHIUM BATTERIES INSTALLED IN CARGO TRANSPORT UNIT, see special provision ~~6XX 389~~ in Chapter 3.3.”

15. In 3.3.1, amend special provision 389 to read:

“389 (Deleted)”.

Annex

Websites with information on energy storage systems:

<https://www.tillquist.com/en/energy/energy-storage/ees-energy-storage-systems>

<https://www.atlascopco.com/sv-se/construction-equipment/products/energy-storage-systems/large>

Comparison between new special provision 6xx and existing special provision 389 (new text in bold)

“6XX This entry only applies to cargo transport units in which lithium ion batteries or lithium metal batteries are installed and which are designed only to provide power external to the unit. **No other requirements of ADR/RID apply except for the following provisions:**

The lithium batteries shall meet the provisions of 2.2.9.1.7 (a) to (g) and contain the necessary systems to prevent overcharge and over discharge between the batteries.

The batteries shall be securely attached to the interior structure of the cargo transport unit (e.g., by means of placement in racks, cabinets, etc.) in such a manner as to prevent short circuits, accidental operation, and significant movement relative to the cargo transport unit under the shocks, loadings and vibrations normally incident to carriage.

Dangerous goods necessary for the safe and proper operation of the cargo transport unit (e.g., fire extinguishing systems and air conditioning systems), shall be properly secured to or installed in the cargo transport unit and are not otherwise subject to ADR/RID. Dangerous goods not necessary for the safe and proper operation of the cargo transport unit shall not be carried within the cargo transport unit.

The batteries inside the cargo transport unit are not subject to marking or labelling requirements. **Where the maximum total energy content is above 100 kWh**, the cargo transport unit shall bear orange-coloured plates in accordance with 5.3.2.2 and placards in accordance with 5.3.1.1 on two opposing sides.”