

## UECC Electric Vehicle Guideline.

UECC, the leading provider of sustainable short sea ro-ro transportation in Europe, is continually proactive in mitigating actions to protect human life, prevent marine pollution and facilitate the safe transport of goods by Sea.

With our company values: Unity, Energy, Challenging and Commitment, we develop and drive our performance focusing on positive changes delivering better environmental standards and innovative solutions for the maritime industry, our vessels, and customers.

In line with our forthcoming LNG Battery Hybrid PCTC's, UECC has developed an EV guideline applicable for carriage on all UECC vessels.

In the unlikely event of an incident, accident, or emergency on board, which may be directly or indirectly related to any type of Vehicle or Ships machinery, Fire is a major concern. Preventative actions to mitigate the chance of fire elements, heat, fuel, and energy release are of upmost focus for the safety of our Crew, Vessels and your cargo.

**UECC recommend, but not limited to, the following Minimum and Maximum SOC values for your EVs High voltage battery during the Marine Transport.**

**Minimum and Maximum SOC percentage as 20% and 50% respectively.**

Vehicles with SOC rating in kW/h, to have values within the respective 20%-50% charge range.

Vehicles showing only a Full to Empty measurement gauge to have a level indicating between the 20%-50% range.

Vehicles which can be set in to a 'transport mode', which run on a 'power down' modus throughout the logistics chain, must have sufficient battery power to safely operate the basic functions of the Vehicle.

All hybrids with possibility to drive on the 'ICE' with the electric mode disengaged, are requested to do so. If this is not possible, the Vehicles are recommended to have the SOC within the 20%-50% range.

The lower end SOC 20% limitation is recommended to ensure minimum basic driving and operation of the Vehicle, covering dwell time at port, vessel load and discharge operations, to First Point of Rest.

The higher end SOC 50% limitation is recommended to accommodate Vehicles with smaller powered battery packs to facilitate driving requirements from factory distribution line to final port of discharge, including without guarantee, a +/- driving distance of 20km to dealership and/or to an available localized recharging point.

The higher end SOC is also recommended to avoid unnecessary carriage of charge and power during marine carriage. Limiting a Vehicle's SOC may act to mitigate degradation of the battery thermal stability and therefore reducing any potential vented gas & fire risk.

## UECC Electric Vehicle Guideline.

### **Marine Carriage safety**

The following operations are not permitted onboard UECC vessels:

- Charging of Vehicles during a sea-passage.
- Replenishing of liquids and cooling agents for batteries.
- Replacement of batteries.
- Maintenance work of any description to any Vehicle.

As Lithium Batteries have various chemical compositions, the OEM may be requested to provide a Material Safety Data Sheet or Rescue card detailing process, and preventative actions to be taken in case of any accident or damage to a Vehicle which may affect the battery composition and safety.

A Material Safety Data Sheet or Rescue card is to include handling of the Vehicle, detailed of firefighting measures, gas control processes and any necessary PPE for heat, flame, and/or toxic gas which may be emitted from the Vehicle.

UECC vessels apply Detection and Safeguards in accordance with Class Rules with fire suppression and ventilation systems routinely tested.

Close Monitoring of other cargos in adjacent areas is also regularly conducted.

### **Booking of EVs**

**All bookings should be accompanied with following:** Make, Model, Vin, EV type (BEV, PHEV, HEV, FEV).  
Rescue card / Handling instructions to be provided by Shipper.

Any history of re-work undertaken on the high voltage battery, or any other previous battery damage must be declared, and authorized by UECC for loading prior to sailing.

A **minimum** 24hr Dwell time is required between the completion of any re-worked Vehicle and the loading on any UECC vessel.

### **Receipt, Marking, Identification of EVs.**

All Vehicles must be received fully functional, self-propelled, safe to drive, damage free, and in clean condition.

All Vehicles are requested to have clear and precise identification on the windscreen, either placard or other marker type, detailing battery type (BEV, PHEV, HEV, FEV), load port, discharge port.

## UECC Electric Vehicle Guideline.

### **Loading of Vehicles**

All Vehicles must be loaded self-propelled-

Vehicles not starting at time of loading will not be permitted to receive a temporary re-charge to facilitate the single purpose of loading the Vehicle on to the vessel. Non- starting Vehicles will be allocated to the next vessel only after being checked by OEM approved technicians and SOC reset.

Towing of Vehicles in the loading process is not accepted.

Vehicles found to be in damaged, or in unsafe condition will not be loaded unless approved by UECC. Such units will only be accepted for Piggy-back carriage.

Piggy-Back carriage of Vehicles can be accepted either on truck, trailer, mafi, bolster or other accepted method of transportation. The 12v battery system must be disconnected and secured in a way that it cannot inadvertently draw power from the HV battery and Vice Versa. At the time of disconnection of the 12v battery, the vehicle is recommended to have SOC in the 20% - 50% range.

Vehicles with any form of battery damage are not permitted for loading as self-propelled.

These can be accepted as 'Piggy-back' carriage with the prior written approval of UECC.

Both 12v and High Voltage battery systems must be disconnected.

At the time of disconnection, it is recommended that the vehicle SOC is in the 20% - 50% range.

The shipper must provide reasoning for requirement of any 'Piggy-Back' carriage.

The shipper is responsible for all technical arrangements with ports / terminal / or other service provider to disconnect the batteries. Such work must be done by trained / certified personnel and is done at the risk and cost of the shipper.

UECC at all times reserves the right to refuse shipment of any Vehicle if deemed unsafe.

### **Discharge of Vehicles**

In case of a Vehicle not starting at time of discharge, the 12V battery may be connected to a 12v booster pack to provide sufficient energy to activate the HV battery for discharging from the vessel.

If this process is not successful, the vehicle may be moved using go-jacks or other available towing facilities. This is to minimize the risk of damage to the vehicle and those around it during the continuing cargo operation.

## UECC Electric Vehicle Guideline.

### **Recommendations for Battery Protection:**

#### Low ground clearance:

EV batteries are commonly positioned under the vehicle between the 2 axles. In some cases, battery packs may sit lower than the visible door sill.

Vehicles with low ground clearance should be clearly labelled by OEMs to draw attention to low ground clearance batteries which could lead to challenges with cresting and break-over angles on vessel ramps and inner slopes. UECC request pre-notice of low ground clearance units with information detailing the cresting and break over angles of such EVs.

OEMs should consider the use of spring blocks or other methods to control suspension movement on vehicles with low ground clearance, or under battery plate protection covers as a prevention measure against damage to vehicles with low ground clearance.

UECC reserves the right to make any damage preventable measures in its own discretion, to avoid any ground contact and damage to batteries.

UECC also makes the following recommendations to preserve batteries:

#### Battery Build:

- Battery management system to detect any rise in temperature within its cells/modules and instigate an immediate system shut down if fact/risk detected.
- Battery management system to monitor voltage of all cells and instigate immediate system shut down if fault/risk detected.
- Battery management system to control / balance voltage in all cells to maintain balance of power throughout the whole battery.
- Individual cell housings for protection against thermal runaway spreading.
- Integration of cooling heat sink for each module.
- Integrated pressure relief and exhaust system for venting of gasses.
- The battery casing design must mitigate against external fire hazards.
- Fire retardant enclosures may offer valuable time in which to control any external fire before the HV battery may be at risk.

### **Certification UN 38.3 Lithium Battery.**

All Vehicles with a lithium-ion battery, must have successfully passed pressure, temperature, crush, and impact tests as described in the UN 38.3 code (certificate) for transport of lithium-ion batteries. Certification is to be provided to UECC if so requested.

## UECC Electric Vehicle Guideline.

### **Breach or Non-Compliance**

The shipper, and/or the OEM at all times has the duty of care to ensure that all Vehicles are safe and suitable for marine carriage.

In the event of a unit not meeting the abovementioned EV Guideline, UECC reserves the right to refuse shipment, with UECC staff or representative having final decision if a unit can be shipped. Where any Vehicle fails to meet the abovementioned conditions during loading, shipping, transshipment and/or discharge, UECC reserves the right to engage any 3<sup>rd</sup> party assistance in either bringing the Vehicle up to UECC shipping standards, or removal from a vessel by whatever means entirely at Shippers liability and cost.

Due to the nature of any secondhand Vehicle, claims for damages are not accepted. Condition disputes may be considered only if the damage is clearly proven to have occurred in UECC marine transit.

### **Definitions.**

EV's - Electric Vehicles (including second hand & POV EV's, Cars, Vans, Buses, Trucks, Motorcycles and/or any other form of electric battery powered vehicle.

POV – Privately Owned Vehicles,

BEV - Battery Electric Vehicles,

PHEV - Plug-In Hybrid Electric Vehicles,

HEV – (Self charging) Hybrid Electric Vehicles,

FCEV - Fuel Cell Electric Vehicles.

ICE – Internal Combustion Engine.

**(together the “Vehicles”)**

OEM's – Original Equipment Manufacturers

SOC – State of Charge - the level of charge of an electric battery relative to its capacity.

UECC – United European Car Carriers

UECC vessel - both UECC owned and chartered/operated vessels.