1.1 Over-temperature Protection

1.1.1 Rationale
Verify the functionality of the over-temperature protection, if any necessary for safety reasons that prevents the operation at over-temperatures inside the [RESS]. This test should simulate the lost of thermal control.

This procedure imposes unreasonable design restriction to have cut-off function, although another solution, e.g. protection by PTC of cell, may exist. As this procedure has never discussed at international standardization bodies, careful review with a view to the practicality is necessary.

1.1.2 Requirement
When the maximum working temperature of the [RESS], specified by the manufacturer, is exceeded, the [RESS] high voltage buses shall be opened or the battery cannot be operated at the latest [5 min] after this temperature is reached.

After the test, the components shall be functional.

3.9.2.1 Conditions
The [RESS] shall be at any state of charge, which allows the normal operation of the power train as recommended by the manufacturer.

The [RESS] shall be placed in a convective oven or climatic chamber (hereby called over-temperature room). The over-temperature room temperature shall be increased at a rate of de 5 °C/min ± 2 °C/min until it reaches the maximum working temperature of the [RESS], specified by the manufacturer + 20°C. The [RESS] temperature shall be monitored by the measurement devices which are integrated inside the [RESS] by the manufacturer.

Temperature measurement shall be performed inside the [RESS]. Cooling system, if any, shall be deactivated if the [RESS] is able to operate under this condition. In the other cases, the manufacturer shall demonstrate by test that the operation of the [RESS] stops when deactivating its cooling system. Then the [RESS] doesn't have to fulfill over-temperature test requirements, but the manufacturer shall provide the technical service with the relevant information showing that the cooling system is well-dimensioned and fits with the [RESS]' thermal exchanges, and reactivated for the verification in 3.9.3.

The manufacturer shall provide the technical service with the relevant technical information dossier of the measurement device. The content of this information dossier shall be provided by the technical service.

The test shall be interrupted when the requirement is satisfied or when the [RESS] reaches or exceeds the maximum working temperature specified by the manufacturer for more than 5 min without satisfying the requirement.

3.9.2.2 Acceptance criteria
The [RESS] complies with the requirement when operation of the [RESS] stops, the signal related to the stop of operation physical opening sent by the BMS is detected.

- [a] of undefined visible venting => action item for German working group / UTAC /SP/ Autoliv
- b) battery enclosure rupture (no degradation of protection degree)
- c) fire
- d) explosion.

1.1.3 Verification
[The internal temperature and the signal related to the opening of the high voltage buses of the [RESS] are monitored. In order to verify the functionality of the components, the [RESS] shall rest until it reaches the ambient temperature (25°C ± 5°C). A charge/discharge cycle shall be applied to the [RESS]. The charge and discharge shall be functional. During the test and before the verification, to give the possibility to make a reset of the default.]