

## **JRC Opinion on NHTSA State of Charge Adjustment Proposal**

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As stated during previous TF6 meetings, JRC considers SOC is an important parameter for the assessment of the safety performance of a REESS or an electric vehicle. As agreed by TF6, JRC concurred that SOC adjustment should achieve an SOC closest to the upper limit of the system i.e. as close as possible to 100% of the normal operating range. JRC's research showed that a certain tolerance of SOC measurement shall be taken into account, therefore at least 95% of the maximum normal operating SOC range was suggested for REESS level tests and vehicles with external charging capabilities. Following information provided by industry, JRC recognized the difficulties to adjust and maintain an SOC higher than 90% specifically for vehicles without external charging capabilities (i.e. HEV).

Following discussions on SOC adjustment during Informal Group and Task Force meetings in Washington and Changchun NHTSA has expressed their position on SOC adjustment both at vehicle and REESS level. Their position is largely in line with the TF6 proposal (EVS-08-07e), however, some modification with respect to SOC level at the beginning of tests and the time elapsed between SOC adjustment and the test has been proposed.

### **SOC level at the beginning of the test**

JRC considers that the NHTSA position to perform tests on a vehicle or REESS subsystem when "*the SOC shall be no less than 95 % of the SOC according to paragraphs 6.2.1.2.1. and 6.2.1.2.2. for REESS designed to be externally charged and shall be no less than 90 % of SOC according to paragraphs 6.2.1.2.1. and 6.2.1.2.2. for REESS designed to be charged only by an energy source on the vehicle.*" to be:

- In agreement with TF6 stated objective with regard to SOC adjustment to "achieve the SOC closest to the upper limit of the system".
- Synchronized more accurately with the TF6 rationale and justification text in as far that these texts exclusively outline practical difficulties in adjusting and maintaining SOC levels immediately before crash tests only for vehicles with no external charging capabilities. JRC still appreciates that SOC adjustment and maintenance for these vehicles is technically challenging, therefore a higher SOC tolerance (i.e. up to 10%) is acceptable for these vehicles as outlined in the justification. It is noteworthy to mention that during discussions within TF6 experts outlined that HEVs use only a narrow range compared to other vehicles and accordingly the expected impact of variation in SOC on the safety performance will be less significant for HEVs.

### **48 h elapsed time before tests**

We note that the TF6 proposal justification does not provide a basis for specifying the time within which a test is to be performed following adjustment of the SOC i.e. 48 hours. Such a justification needs to be provided demonstrating that SOC can not drop below the required level within 48 hours, otherwise the text proposed by the US may be appropriate and sufficient considering:

- The observation from testing bodies of "*the relative simplicity in attaining and maintaining SOC at 95% of the maximum SOC under normal use as specified by the manufacturer for electric vehicles (EVs) and plug in hybrid electric vehicles (PHEVs) by charging the vehicle just prior to testing*"
- The technical feasibility of verifying that SOC is achieved and maintained, as already foreseen in the TF6 proposal Procedure.