ETCS-FRMCS Compatibility

Legal & Authorisation Working Group Output

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WG2 L&A Outputs

High level Problem Statement:
Technical and legal non compatibility of FRMCS with existing and pre 2030 planned fitment on board subsystems

L&A Key findings:

SV2.0 and 2.1 do not account for the existence of FRMCS. The proposed changes (adaptor and BS-Light with FRMCS) do not change ETCS functionality but only change the communications options and maintain or exceeding existing levels of reliability

It is our opinion that the current TSI is not compatible with existing subsystems which are already commercially available in relation to the above problem statement. In line with Article 7 of EU 2016/797 the updating of existing subsystems would compromise the economic viability or compatibility of the subsystem.

From an authorisation view in relation to Article 21 EU 2016/797, item 12(b) highlights the requirement for authorisation whenever the safety of the subsystem is adversely affected by the works or 12(c) required by the TSI. The proposed solutions do not directly alter the ETCS safety function. TSI 7.2.2.2 item (2) would be deemed to be met, i.e. that the introduction of BS Light or adapter would not change the state expected during the original authorization. Moreover, the technical compatibility with the network is not affected.

A new change Request (additional to CR1359) would need to be introduced to enable compatibility, (Review of error correction impact is still required)
Articles 24 EU 2016/797 provides the detail on vehicle type authorisation following change. Article 25 allows for authorisation of a series of vehicles which are in conformity with an existing authorised vehicle type without further checks.

There are no recommendations from the L&A WG to suggest the need for alterations to the directives

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Recommendations

Proposals:

Align TSI27 activities to incorporate the necessary changes to legally and technically allow the compatibility and use of the baseline light solution to interface FRMCS with SV2.0 & 2.1 *(EU 2018/545 Article 17 3.)*

If timelines (2027/8) permit changes to TSI: *(ref. 7.2.4.1.2-(4) Permissible to use the most recent version of any TSI)*

- Introduce the TSI changes required as part of TSI27 that will enable FRMCS compatibility with baseline 3 system versions
- Introduce the differentiation of safety and non-safety functions and define that changes of the non-safety part do not require new authorisation. Non safety changes would reduce the requirement for NOBO verification and allow ASBO system compatibility verification only.
- Amendment of CR1359 (packet 245) to account only for the changes necessary for FRMCS compatibility to the baseline light solution.
- Indicate that ATO is out of scope for baseline light.

If timelines do not permit:

- Request the provision of a Technical Opinion on the backwards compatibility of FRMCS with Baseline 3 system versions.
- Member states could submit derogation requests for the allowance of backwards compatibility of FRMCS with Baseline 3 system versions in reference to partial fulfilment as detailed in Appendix G (1) and (2)(c) – considered an undesired solution, if no European solution can be defined.

Request that wherever possible, the vehicle series type compatibility with an authorised vehicle of the same type is applied with no further testing requirements for subsystem compatibility

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Recommendations – TSI changes

Table B1: - Whilst most items for vehicles in service are not applicable it is felt the following need capturing:
Item 5,6,7 (ref. 7.4.2.4) and item 8 (7.4.2.3) Need to ensure the design change phase for BS Light does not prevent compatibility with SV2.0/2.1
Item 16 (6.1.1.2) (Appendix G) after point (c) Include reference to SV2.0 pending full functionality upgrade

7.3.2 Add section relating to dual operation and migration between GSMR and FRMCS
6.1.2 Add reference relating to testing of dual operation and migration between GSMR and FRMCS
7.2.2.1 Table 7.1 Basic design characteristics will need to be amended for FRMCS and baseline light and 7.2.2.4 in relation to changes to the non-safety part not driving authorization of the safety part.

An additional CR will need to be raised to avoid the alteration to the ETCS application and introduce an alternative network selection methodology for BS light by modification of the co-ordination function to select when GSMR / FRMCS will be chosen and to capture DMI presentation changes.

Assumptions & Prerequisites

BS Light

1. May need authorisation (unless TSI CCS is changed) due to change in the co-ordination function and SS37-3
2. No change to safety function therefore a lighter authorisation requirement could be expected
3. Change to the legal framework regarding statements on SV3.0 and the need to reference SV2.0/2.1
4. CR1359 cannot be implemented as it is now and an additional CR will be required for BS Light
5. The target functionality of the EVC remains unchanged
6. The application layer interfaces relevant to technical compatibility remains unchanged

Adaptor solution

1. Considered as external to ETCS on board and no change to the safety part
2. Physical and application layer Interface to existing EVC remains unchanged
3. Introduces the new interface for FRMCS as detailed in B4
4. Expectation that compatibility validation will be required
5. No impact on error correction updates
6. Co-ordination function similar to the ones specified in SS37-1 will sit in the adaptor and not the EVC
7. Solution A aligns to 2.0 and Solution D aligns to SV2.1

On-board FRMCS

Changes of products and systems that are categorized as a “non-safety” part should not require validation of the safety part