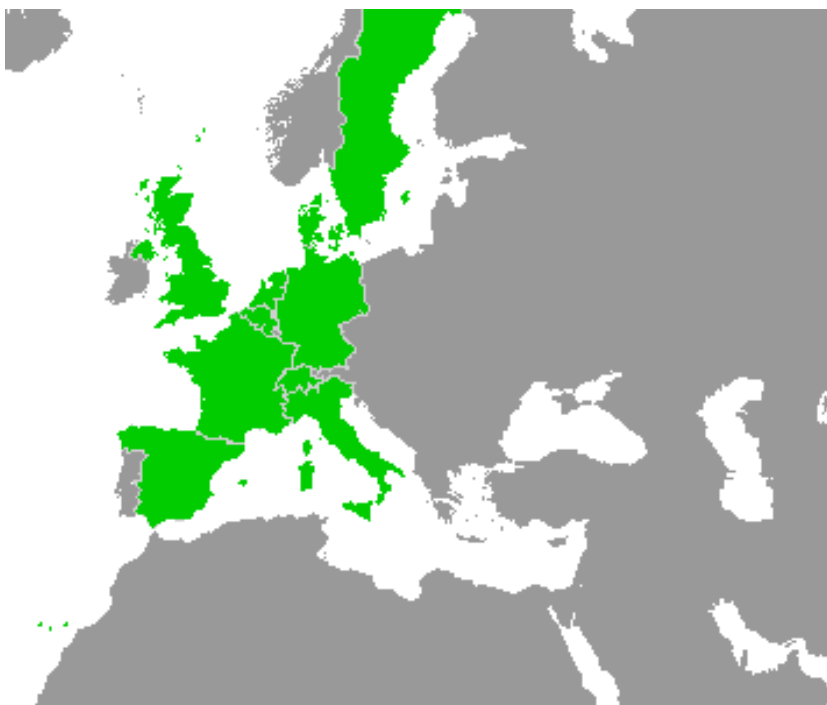


Work-Package 2: “Requirements”

## SRS subset for modelling tool benchmarking

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# SRS subset for modelling tool benchmarking

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## Requirements

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**Abstract:** This document defines the subset of SRS SUBSET-026 that should be used to evaluate modelling tools.

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## 1 Introduction

One goal of openETCS is to make a model of the ERTMS/ETCS System Requirement Specification (SRS). Several tools are possible to make this model. In order to evaluate them, we need to define a subset of the SRS that would be modelled by each tool, therefore allowing to compare the tools on the same basis.

This document defines this subset of SRS.

## 2 SRS Subset definition

The following paragraphs of UNISIG *SUBSET-026 v3.3.0* should be used in the benchmarking model in order to evaluate a tool. This subset is divided into two subsets: a high priority subset that should be modeled first and a lower priority subset that should be modeled if time permits.

### 2.1 High priority items

**§3.5.3 Establishing a communication session** Rationale: Sample of the communication part.

**§3.13.4 (Acceleration / Deceleration due to gradients)**

**§3.13.6.2 Emergency brake** and more particularly:

§3.13.6.2.1.3 (calculation of  $A_{safe}$ , function of  $V$  and  $d$ , depending on the gradient profile, braking models of the train, several correction factors etc; this is the basis of the EBD curve, see Figure 38)

Rationale: handling of functions providing deceleration value for a particular braking model (and thus handling of data structures allowing to represent a braking model, for example  $A_{brake\_emergency}$ ), a gradient profile, a set of track conditions, adhesion factors etc; graphical representation of such functions.

**§3.13.7 Determination of Most Restrictive Speed Profile (MRSP)** Combine for example several TSR and LX restrictions

Rationale: handling of step functions; combining several step functions in order to determine the most restrictive speed profile; graphical representation of such functions.

**§3.13.8.3 Emergency Brake Deceleration curves (EBD)** Rationale: computation of a deceleration curve by combining a step function and a function like  $A_{safe}$ ; graphical representation of the curve.

**§3.13.9.3.3.9 Computation of  $d_{FLOI}$ , using  $d_{SBI2\_MREBDT}$**  (MREBDT: Most Restrictive Target amongst the EBD based targets)

Rationale: computation of the most restrictive target from a set of targets by comparing the SBI2 supervision limits associated to each target for a given speed; determination of the supervision limit function which location is the closest to that target.

**§3.13.9.4 Release speed supervision limits** and more particularly:

§3.13.9.4.7 (computation of different release speed supervision limits)

Rationale: computation of supervision limits from an EBD (or SBD) curve.

§3.13.9.4.8 (computation of the most restrictive value at the Trip location related to the EOA, amongst several EBI supervision limits)

§3.13.9.4.8.2 (iterative computation of the release speed)

Rationale: ensure the model can handle such algorithms.

§3.13.9.4.9 (using of the most restrictive MRSP value instead of the release speed)

Rationale: determination of the most restrictive value of a step function on a given interval; re-evaluation of the interval's bounds according to the obtained result.

#### **§3.13.10.4.2 Calculation of the MRDT (Most Restrictive Displayed Target)**

**§4.6.2 (Transitions Table) and §4.6.3 (Transitions Condition Table)** Only transitions:

1. from SB to SH
2. from SB to FS
3. from SB to IS

Rationale: Having transitions at different priority level is important to look at priority issues and exclusion issues at the same priority level.

**§5.9 Procedure On-Sight** Rationale: Procedure sample, contains a timer. Procedure not too long compared to Start of Mission.

## **2.2 Lower priority items**

**§3.6.3.2 Location, Continuous Profile Data and Non-Continuous Profile Data** Rationale: example of complex generic data structure.

**§3.8.3 Structure of Movement Authority and §3.8.5 Update of Movement Authority** Rationale: example of complex procedure, with complex data.

**§3.11.3 Static Speed Profile and §3.11.12 Gradients** Rationale: example of data structure, referring to §3.6.3.2 and used by §3.13.4.

**§4.8.3.2 From National System X (through STM interface)** Rationale: Model a small table.  
 FIXME: Isn't such a table redundant with §4.6.2? FIXME

**§8.7.2 Movement Authority message** This includes reference to Packet 15 (§7.4.2.4). FIXME  
 Maybe reference one optional packet

Rationale: That would be a perfect use case for tools able to model things down to bit level.

## **3 Other open questions**

FIXME: Should we model an API? E.g. Odometer? Which reference document?

FIXME