ITEA 2

INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

openETCS

Verification Closing Session: Train Positioning

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MINISTERIO DE CIENCIA E INNOVACIÓN

Verification Closing Session

Marc Behrens

Brunswick, 28-29.10.2014

WP 4 Verification Closing Session

Agenda day1

Formulate the criteria to judge

- 09:00 - 09:20 alongside of 'information chain' of scenarios – Marc Behrens
- 09:20 - 09:40 alongside safety issues - Jan Welte
- 09:40 - 10:00 alongside interfacing issues - Jens Gerlach
- 10:00 - 10:30 agreement on criteria – Marc Behrens

Presentation of approaches and verification

- 10:30 - 10:50 Presentations from NS on the principles of the calculation of the distance between the train and any track side location - Jan Welvaarts
- 10:50 - 11:00 Break
- 11:00 - 11:20 Talk of Siemens on the principles of the calculation of the distance between the train and any track side location. - Uwe Steinke
- 11:20 - 11:40 Presentation of Verification Results - Bernd Gonska
- 11:40 - 12:00 agreement on the criteria – Marc Behrens

WP 4 Verification Closing Session

Agenda day 1

- 12:00 - 13:00 Lunch
- 13:00 - 14:00 Discussion (chaired by DLR) to find the fundamental differences (if any) – Marc Behrens

Comparing Simulation Results

- 14:00 - 14:45 Comparing Simulation results – Uwe Steinke
- 14:45 - 15:30 Comparing Simulation results – Vincent Nuhaan
- 15:30 - 15:45 Break
- 15:45 - 16:15 Comparing Simulation results – Bernd Gonska
- 16:15 - 17:00 Discussion of the simulation results to support the conclusions of the morning session – Vincent Nuhaan
- 17:00 - 18:00 Converge to one principle solution – comparing on theoretical basis? Marc Behrens/ Bernd Gonska

WP 4 Verification Closing Session

Agenda day 2

Agenda Day 2 29.20.2014

- 09:00 - 18:00 Depending on the outcome of the first day: detail the principle solution (maybe in two groups of 3)
- Working out missing details and agreement on details
- Documenting the results of day 1
- Writing Report

User Stories

- **US-RO-01: As a railway operator I want to have a safe system in order to reach freedom of unacceptable risk or harm.**
- **US-RO-02: As a railway operator I want to have no special solutions after the system is build.**
- **US-RO-03: As a railway operator I want to take into account all information available for train positioning to reach the highest accuracy and best operating performance.**
- **US-RO-04: As a railway operator I want to have a interoperable ETCS executable model so that I have a reference for further tender.**

Objectives of Verification Closing Sessions

Verification Objectives

- **Object verification:**
  - **Concept of Train Positioning by Uwe Steinke**
  - **Concept of Train Positioning by Jan Welvaarts**
- **Process exemplification: Of a Verification Closing Session**

VnV Means:

- **Pen and Paper**
- **Independant validation:**
  - **LabView validation model and scenarios by Vincent Nuhaan**
  - **Manual Calculation and scenarios by Bernd Gonska**
- **Simulation with Scade**

Criteria to judge train positioning

- **Safe System (US-RO-01)**
  - **No unsafe state:**
    - ***Never act too late (e.g. TSR)***
    - ***Never drive into an unsafe situation (e.g. beyond Danger Point)***
- **System to take into account all cases/ exceptions. (US-RO-02)**
  - **Cases which are not described within the SRS are to be defined.**
  - **Cases defined in the SRS have to be applied**
- **Highest accuracy and best operating performance (US-RO-03)**
  - **Calculation of information chain: Target ← LRBG → Train min/max safe front end or ertimated position**
- **ETCS Interoperability (US-RO-04)**
  - **Or state where we cannot be conform → specificational findings**

Agreement on criteria to judge

Criteria to judge train positioning

- **Safe System (US-RO-01)**
  - **No unsafe state (including accuracies):**
    - ***Never overestimate the minimum distance to the target***
    - ***Never underestimate the maximum distance to the target (e.g. TSR)***
- **System to take into account all cases/ exceptions. (US-RO-02)**
  - **Architecture, data structure and formulas should cover all possible situations. Check for completeness of system states.**
- **Highest accuracy and best operating performance (US-RO-03)**
  - **Never underestimate the minimum distance to the target.**
  - **Never overestimate the maximum distance to the target.**
- **ETCS Interoperability (US-RO-04)**
  - **Show conformity to Subset-026 and**
  - **state where we cannot be conform → specification findings**