SFERA
STAKEHOLDER WORKSHOP

UIC HQ, Paris – 05/11/2018

Communication with Driver Advisory Systems
IRS 90940
INTRODUCTION (11:00-12:00)
INTRODUCTION

THE SFERA PROJECT / Organisation

Chloé LIMA-VANZELER – SNCF Mobilités
WHO WE ARE

Cooperation between Railway Undertakings and Infrastructure Managers

Coherency
Interoperability
Competitiveness
WHO WE ARE

SUSTAINABLE DEVELOPMENT
Making railways greener, quieter and more energy efficient

CO2 reduction
Standardization of energy management
WHO WE ARE

Infrastructure Manager
- DB Netz
- SNCF Réseau
- ProRail
- Infrabel
- SBB
- Trafikverket
- ÖBB
- Bane NOR

Railway Undertaking
- DB Cargo
- SNCF Mobilités
- NS
- SNCB
- SBB

#Drivers  #DAS  #Traffic management  #Energy management
WAS IST DAS?

Driver Advisory System

➔ Tool providing advice to the driver in order to be on time & save energy.

➔ It can be stand-alone or connected to the Traffic Management System.
SFERA PROJECT

TARGETS

➔ Facilitate the use of Connected-Driver Advisory Systems (C-DAS) for international traffic by standardizing the data exchange between on-board systems and Traffic Management Systems (TMS).

➔ Automate the transmission of TMS decisions to all trains in a multi-RU environment, by implementing the conditions for the development of "off the shelf" C-DAS products.

The scope includes both ERTMS/ETCS Limited Supervision and Class B train protection systems.

OUTPUT

UIC International Railway Solution 90940 (IRS 90940) defining these data exchange requirements: model, content, format and mechanisms of C-DAS data exchange between on-board and ground systems.
WHY WE DO IT?

- Energy costs for EU railways total about 6 Billion € per year.
- DAS is a major lever to reduce energy consumption: average savings are estimated between 5-10% for simple DAS and up to 12% for connected-DAS.
- Current implementation is very low.
- Different solutions are developed.
- Different communication protocols used by infrastructure managers.
WHAT’S THE PROBLEM?

If we don’t do SFERA, the risks are:

- Each actor will develop a system on its own (algorithm, data, functional rules…)
- Systems will not be interoperable → difficult for international railways to reduce their energy consumption and costs
- Infrastructure Manager will have to be able to handle different languages according to the DAS used by the railway operators
- Higher costs for DAS systems if each project needs to define its own protocol
- Difficulty in the evolution of the systems
- ...
WHO YOU ARE

RAILWAY UNDERTAKINGS
INFRA MANAGERS
ROLLING STOCK MANUFACT.
DAS SUPPLIERS
TMS SUPPLIERS
EUROPEAN AGENCIES
ETC.
WHAT WE NEED FROM YOU

Get your feedbacks in order to improve the IRS:

- QUESTIONS
- RISKS IDENTIFIED
- REMARKS

And after the meeting on: sferafeedback@gmail.com
ORGANIZATION OF THE DAY

11:00 12:00 13:00 14:00 15:30 17:00
INTRO  PLENARY SESSION  LUNCH BREAK  INTERACTIVE SESSION  PLENARY SESSION

6 stands = 6 topics
2 project members

1 / Write down on post-its:
- Your questions
- Your comments
- The risks that you identify

2 / Vote with stickers on the post-its that make sense to you

Q?  C  R!
INTRODUCTION
THE SFERA PROJECT / How we do it

Jan HOOGENRAAD – NS
PROBLEM DEFINITION – BIRDS EYE

- DAS and ATO need good data
- The simplest case is S-DAS, where data is loaded once to train / tablet
- S-DAS should be internationally interoperable, too
- Even for S-DAS, no data standard was present
- C-DAS is just data updates (DAS-O) or moving parts of calculations (DAS-I, DAS-C)

So:
- SFERA project first tackled S-DAS
- Then, the project proceeded to C-DAS and ATO
WORK PACKAGES

Work Package 1: S-DAS (Standalone DAS)
- Main objective: Define data format
- Formalise data communication roles and processes

Work Package 2: C-DAS (Connected DAS)
- Extend S-DAS work and define
  - Use cases
  - Model
  - Data format

Work Package 3: DX (Data Exchange)
- Define data exchange methods and protocols between on-board and ground (TMS) systems
WAY OF WORKING

- Group with representatives of IM-s and RU-s
- Takes into account all national particularities
- Consults with internal organisation and suppliers
- Makes a proposal
- Bi-weekly conference calls
- Bi-monthly group meetings

- End product tested
RELATED PROJECTS

For each of the projects below, Link person(s) have been assigned from SFERA

**ON-TIME** Project (*Optimal Networks for Train Integration Management across Europe*)
- Link: ON-TIME has developed a “Specification of a driving advisory systems (DAS) data format” (*Deliverable 6.1*)

**ERA/Shift2Rail ATO** (Automatic Train Operation)
- Link: ERA and Shift2Rail are working on ATO over ERTMS. They limit their scope to C-DAS and ATO under ETCS Full Supervision, not covering other train protection systems.

**railML** and **RailTopoModel**
- Link: railML is a language to model railway data and RailTopoModel is a topology model of the railway system.
QUALITY PROCESS SETUP

INTERNAL APPROVAL
IRS should be accepted by all opt-in members.

STAKEHOLDER FEEDBACK
External parties (e.g. non-SFERA RUs, IMs, manufacturers of TMS + DAS systems, ERA, Shift2Rail, railML) are welcomed to give feedback

IMPLEMENTATION & TESTING
The SFERA railways have performed the following 4 tests and reported the results:

1. First test: Develop test tools (proof-of-concept) that convert existing data to SFERA format
2. Second test: Convert data to SFERA and from SFERA to specific S-DAS devices
3. Third test: Live train runs for S-DAS
4. Fourth test: Validate compatibility with subset-126
QUALITY OUTCOMES

INTERNAL APPROVAL
All opt-in members support the solution, and are preparing for implementation

STAKEHOLDER FEEDBACK
This workshop, and follow-up review rounds

IMPLEMENTATION & TESTING
The SFERA railways have performed the following 3 tests and reported the results:
1. First test: Converted existing data to SFERA format from Infrabel, SNCF, NS, SBB
2. Second test: SFERA converted specific S-DAS devices: SNCF, NS
3. Third test: Live train runs for S-DAS: Thalys
4. Fourth test: Validate compatibility with subset-126
Is the SFERA process sufficient to mitigate the risks?

- Each actor will develop a system on its own (algorithm, data, functional rules…)
- Systems will not be interoperable → difficult for international railways to reduce their energy consumption and costs
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