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ERTMS/GSM-R OPERATORS GROUP
Ad Hoc Working Group on eREC

Use cases for eREC based on Balise Reader Input

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EVOLUTION SHEET

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0.1	6th October 2016	Ed Nix	First draft
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1.0.0	4th February 2020	eREC working group	Editorial changes, Final edition

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List of Abbreviations

EIRENE	European Integrated Railway Radio Enhanced Network
ERTMS	European Rail Traffic Management System
ETCS	European Train Control System
FRS	Functional Requirements Specification
GSM-R	Global System for Mobile Communication – Railway
ID	Identification
KVB	Contrôle de Vitesse par Balise
OFG	Operators and Functional Group
eREC	enhanced Railway Emergency Call
SRS	System Requirements Specification
TASS	Tilt Authorisation and Speed Supervision
TIG	Technical Industry Group
TSI	Technical Standards for Interoperability
UIC	International Union of Railways
UK	United Kingdom

1 Introduction

The purpose of this paper is to outline the potential eREC use cases using a balise reader.

2 Background

The introduction of the optional eREC feature places a requirement on the Cab Radio to hold the correct eREC Sector ID for the current section of line. During a mission the value of the eREC Sector ID may need to be updated. The eREC specifications identify a number of mechanisms that may optionally be used to provide this update function. The base option being manual driver action and optional automatic solutions driven by the GSM-R network or by balise.

Whilst the balise update mechanism has been identified as a conceptual solution to the update problem, no detailed requirements have been developed.

Some potential system users have expressed concern over an update mechanism that relies on driver input, stating that eREC deployment would be conditional on the implementation of an automated process.

3 Proposal

A number of balise based systems are currently in use around Europe that provide geographic control of on-board functions. Examples include the KVB driven automated Cab Radio border crossing procedure used by Eurostar at the UK-France and France-Belgium borders and the ETCS Eurobalise driven Tilt Authorisation and Speed Supervision (TASS) system used on the UK West Coast Mainline.

The proposal is to use the ETCS Eurobalise general packet 44 to manage the eREC Sector ID update process. This would provide a common solution that will benefit from the ETCS roll-out within Europe. Packet 44 use is governed by a European harmonisation process under the control of the ETCS System Authority.

The aim of this document is to prompt discussion.

4 Assumptions

The following assumptions have been made;

- ETCS Packet 44 (as defined in SS-026) can be used for non-ETCS ERTMS applications both within ETCS areas and non-ETCS areas.
- An ETCS Packet 44 specific use case can be harmonised across multiple regions.
- A suitable interface between the ETCS on-board system and the EIRENE Cab Radio can be realised
- Necessary changes to the TSI can be agreed and progressed.

5 Requirements

The following list outlines requirements that have been identified for the eREC Sector ID update via balise. Each requirement will require validation.

- The current eREC Sector ID must be visible to the driver when eREC is active.
- The system shall be able to detect a missing or defective balise – does this imply the use of linked balises?
- The system must be capable of deployment in both ETCS and non-ETCS areas.
- Should eREC Sector IDs updated via balise have a “Time to Live” capability? This could be used as part of the protection against balise failure.
- Should the Cab Radio notify (how?) the network / driver upon successful eREC Sector ID change?
- The system would need to be able to detect balise reader failure. Upon failure detection the eREC Sector ID shall be reset to zero (or should the driver be alerted and reminded that further changes would have to be undertaken manually?)
- Need to check the requirements against the FRS/SRS eREC elements to ensure there is no overlap.
- There is a requirement to define the system behaviour during start-up conditions. Are there any situations where the last known eREC Sector ID could be retained?
- The following balise driven messages should be available;
    - Start of eREC area (prime)
    - Start of eREC area / Sector ID (trigger)
    - End of eREC area (prime)
    - End of eREC area (trigger)
    - Change of eREC Sector ID / [previous eREC Sector ID] (prime)
    - Change of eREC Sector ID / [previous eREC Sector ID] (trigger)
    - Temporary eREC suspension (prime)
    - Temporary eREC suspension (trigger)
- It shall be possible to configure balise groups for directional applications

6 Supporting Documentation

The following documents relate to the management and use of Packet 44;

- Subset-054: Responsibilities and rules for the assignment of values to ETCS variables.

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