

Imprese Ferroviarie

Loro SEDI

Gestori dell'Infrastruttura

Loro SEDI

Reti Isolate - Esercenti

Loro SEDI

**Fornitori sistemi di protezione e controllo della
marcia del treno**

Loro SEDI

p.c. **MINISTERO DELLE INFRASTRUTTURE E DEI TRASPORTI**
**Direzione Generale per le investigazioni ferroviarie
e marittime**

Sede

Oggetto: Safety Alert. Anormalità di funzionamento del sistema ETCS.

Allegati:

- [1] Safety Alert su ETCS Svezia;
- [2] Preliminary about incident turning plate_sept 2019;
- [3] Safety Alert su ETCS Svizzera 16042020;
- [4] Safety incidents on ETCS Level 2 lines in Switzerland on April 16th and June 27th 2019;
- [5] 2020-04-22_FOT CH_illustration_safety_impact_odometry_fault;
- [6] Safety Alert su ETCS Svizzera 01052020;
- [7] Safety Alert su ETCS Olanda;
- [8] Nota Alstom del 27/04/2020.
- [9] Nota Alstom Ferroviaria Spa Italia del 04/05/2020.

Si sono di recente verificate alcune problematiche al sistema ETCS così come nel seguito specificate:

1. 13/09/2019 (Svezia) Un veicolo di manutenzione equipaggiato con ETCS, OTM, "MTR-E" su linea Botnia ERTMS livello 2 e sistema di bordo ETCS di Bombardier, versione AOS_BV EOS 3 versione 3.1 per il quale è stato rilevato un malfunzionamento collegato con l'installazione dell'ETCS sul veicolo quando si utilizza la piastra girevole che interagisce con le funzionalità dell'ETCS **[1] [2]**;
2. 16/04/2020 (Svizzera) Installazione di ETCS Level 2 Thales (versione fino a 3.5) e sistema di bordo Siemens (Baseline 2). Si è verificato che durante le attività di manutenzione sono stati configurati importanti parametri del contachilometri in modo non corretto, la cui conseguenza è stata che l'OBU ETCS ha subito una perdita sostanziale nella precisione della funzionalità di misurazione della distanza, senza che il processo applicato e il sistema di bordo rilevasse l'errore, dal momento che l'intervallo di confidenza delle posizioni dei treni non era stato rispettato ed era stata superata la soglia di tolleranza. Il treno ha continuato a muoversi in modalità Full Supervision (FS) e ha confermato un

arresto di emergenza condizionale (CES), sebbene avesse già superato la posizione di arresto di emergenza **[3] [4] [5]**;

3. 01/05/2020 (Svizzera) Sistema di bordo ETCS (OBU) di Alstom, versione GATC 5.7.1 con unità di misura della velocità e della distanza (SDMU) versione MK1, GATC 4.9.0.A5. Si è verificato che durante le attività di manutenzione sono stati configurati importanti parametri del contachilometri in modo non corretto, la cui conseguenza è stata che l'OBU ETCS ha subito una perdita sostanziale nella precisione della funzionalità di misurazione della distanza, senza che il processo applicato e il sistema di bordo rilevassero l'errore, dal momento che l'intervallo di confidenza delle posizioni dei treni non era stato rispettato ed era stata superata la soglia di tolleranza. Il treno ha continuato a muoversi in modalità Full Supervision (FS) e ha confermato un arresto di emergenza condizionale (CES), sebbene avesse già superato la posizione di arresto di emergenza **[3] [4] [6]**;
4. 28/04/2020 (Olanda) Si è verificato un problema relativo alla elaborazione a bordo della transizione di livello immediata per ETCS per il quale è intervenuta anche Alstom con la nota del 27/04/2020**[7] [8]**, nonché Alstom ferroviaria Spa Italia che con nota **[9]** del 04/05/2020 ha comunicato che non sussistono rischi per l'operatività dei sottosistemi di bordo Baseline 3 di Alstom ferroviaria Spa con le condizioni di utilizzo attualmente previste ed utilizzate.

In attesa di ulteriori informazioni in merito, tutti i soggetti interessati, ognuno per quanto di competenza, dovranno valutare la pertinenza degli elementi rappresentati nei *safety alert* allegati con il proprio contesto tecnico-operativo ed adottare le necessarie misure di mitigazione riesaminando in particolare l'efficacia delle procedure relative alla progettazione, realizzazione, messa in servizio di tutte le parti del sistema ETCS i cui requisiti di sicurezza possano essere impattati da quanto riferito nei citati *safety alert*.

Si invitano i soggetti in indirizzo ad attivarsi scambiando le informazioni necessarie a evitare che gli eventi possano ripetersi e a fornire riscontro alla scrivente Agenzia anche in merito a casi simili che dovessero essere rilevati nel corso delle attività di rispettiva competenza.

Il Dirigente
Ing. Giovanni Caruso

CARUSO GIOVANNI
AGENZIA NAZIONALE PER LA SICUREZZA DELLE FERROVIE (ANSF)
15.07.2020 15:45:23 UTC



Rolling stock -
other

<i>Equipment</i>	ETCS-equipped maintenance vehicle, OTM, "MTR-E" on ERTMS Level 2 Botnia Line. ETCS On-Board system from Bombardier, AOS_BV release EOS 3 version 3.1.
<i>Description</i>	<p>On Friday, September 13 2019 a safety error occurred on the Botnia Line (ERTMS Level 2) between Solum and Harasjön. The event occurred for a MTR-E type vehicle equipped with a turning device that allows the complete vehicle to by itself turn on the line. The vehicle had a movement authority (MA) in OS which was valid in the opposite direction compared to the vehicle's direction of travel after the vehicle used the turning device. When using the turning device, the ETCS system needs a restart (the power must be switched off), which did not happen. ETCS was then unable to report the correct direction to RBC so a MA was sent for the route that was still locked in the direction of Solum. Along the way, the vehicle reports link errors at the positions where the balises included in the link chain for MA should have been in the direction of Solum. When real balises were passed, there was no reaction because balises were not included in the link chain (all this is according to ERTMS requirements). When the vehicle arrived at the position where the onboard system expected the second balise group, a more powerful reaction came from the ETCS system. The ETCS onboard system applied the operating brake to a full stop and shortened the MA to the front of the vehicle. A text message "balise linking error" was sent to the ETCS on board and to the RBC. At stand still, the onboard system automatically sent a request for a new MA to the RBC. The vehicle received a prolonged MA in the operating mode "On sight". The driver acknowledged operating mode "in the long run" one more time. When the vehicle drove back to Harasjön, two more balise groups were passed without any reaction from the ETCS system. After the vehicle had stopped at Harasjön, it still had a MA, operating mode "On Sight". This could have led to a collision or derailment. After the analyses of log files by the onboard manufacturer, the manufacture concluded that no technical errors were detected. The ETCS system worked as specified. The manufacture and the IM concluded, that the event could happen because of how the ETCS's onboard system was integrated in the particular vehicle type, in combination with the (in)correct use of the vehicle. The RU concluded that the SRAC in the vehicle user manual was not known by the driver. Furthermore, it was unclear what is meant with "to restart the ETCS onboard system". Swedish operational rules need to be clarified for "occupied movements with a MA".</p>
<i>Country</i>	Sweden
<i>Issuer</i>	NSA
<i>Issuing Date</i>	06/05/2020



TRAFIKKVERKET

Preliminary report

Incident on the Breda line

Preliminary report

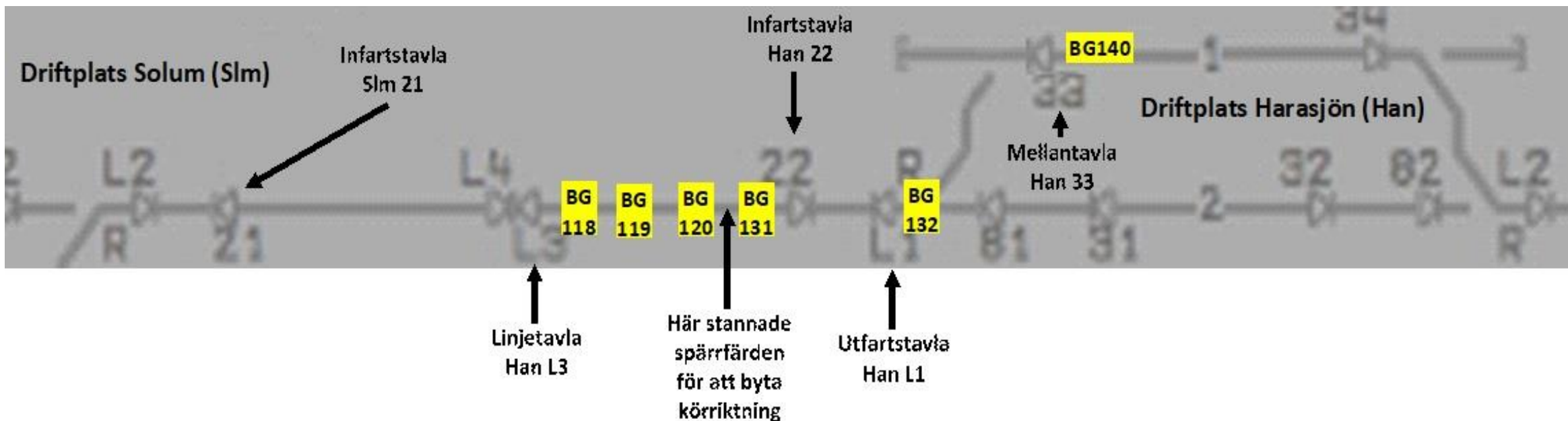
13 September 2019

The line. The maintenance vehicle.



What happened?

1. The maintenance vehicle started with a movement authority, operating mode "full supervision" (MA-FS) from Harasjön track 1 (intermediate board 33, balise group 140).
2. The vehicle stopped out on the line after having passed balise group 131, but before balise group 120.
3. The driver performed a "End of mission" and the MA was withdrawn.



What happened?

4. The driver try twice to activate the B-cab of the maintenance vehicle. The request for a MA is made through the ETCS on board system. The attempt fails.
5. Then the B-cab is de-activated, and the A-cab re-activated again.
6. Now the driver makes a turn of the complete vehicle by using the in-built turning plate. However, the ETCS onboard system is not restarted when using the turning plate.
7. Following the request in the onboard system, the vehicle was given a new MA in operating mode “on sight” (MA-OS), which was acknowledged by the driver.
8. The vehicle starts to drive, now in the direction back to Harasjon. When the expected balise group 120 was not discovered, a text message “balise linking error” was sent to the ETCS on board and to the RBC.
9. The vehicle passes the balise group 131 in the opposite direction. [As the vehicle traveled in the opposite direction, the distance (in the onboard system) to the last position reference increased].

What happened?

10. When the vehicle arrived at the position where the onboard system expected the second balise group (119), a more powerful reaction came from the ETCS system. The ETCS onboard system applied the operating brake to a full stop and shortened the MA to the front of the vehicle. A text message "balise linking error" was sent to the ETCS on board and to the RBC.
11. At a stand still, the onboard system automatically sent a request for a new MA to the RBC. The vehicle received a prolonged MA in the operating mode "On sight". The driver acknowledged operating mode "in the long run" one more time.
12. When the vehicle drove back to track 1 in Harasjon, the balise group 132 and also the balise group 140 were passed without any reaction from the ETCS system.
13. After the vehicle had stopped on track 1, it still had a MA, operating mode "On Sight".

Contributing factors

- In connection with the installation of ETCS on board on the concerned maintenance vehicle, a risk was identified when using the turning plate and its connection with functionality in ETCS.
- In order to mitigate the identified risk, the RU wrote a SRAC in the driver's manual of the maintenance vehicle: *“Note that the ETCS system must be restarted after use of the turning plate in order to change the direction of travel. This is to ensure correct direction in the ETCS system”*.
- This SRAC was not known by the driver.
- The driver did not understand the “balise linking error” message.
- According to operational rules, the driver shall contact the dispatcher when receiving any “balise information error” message. In this case, the driver did not contact the dispatcher until the driver wanted to enter station Harasjon again.

Why no technical solution?

- One of the technical barriers discussed during the implementation of ETCS onboard into the vehicle, was “making ETCS powerless” when using the turning plate.
- However, this option was not chosen because of the risk of locked brakes.
(The braking system of the current vehicle type is so designed, that the brakes lock when rotating the vehicle).

Analyses and conclusion

After the analyses of log files by the onboard manufacturer, the manufacture concluded that no technical errors were detected. The ETCS system worked as specified.

The manufacture and Trafikverket concluded, that the event could happen because of how the ETCS's onboard system was integrated in the particular vehicle type, in combination with the (in)correct use of the vehicle.

The RU concluded that the SRAC in the vehicle user manual was not known by the driver. Furthermore, it was unclear what is meant with "to restart the ETCS onboard system".

Swedish operational rules need to be clarified for "occupied movements with a MA" .

Suggestion (harmonisation)

The ERA's manual for using ETCS on board equipment should be supplemented with a text directed to the driver about what the "linking error" message means and how the driver should act when it occurs.

Clarify which of the various ETCS forms the dispatcher shall use for different stop passage permit. Reduce the number of ETCS forms.

Thales ETCS Level 2 trackside (version up to 3.5) installation and Siemens OBU (Baseline 2).

Description

Human errors in the vehicle maintenance process -> wrong parameters in the on board odometry system -> OBU transmits huge confidence interval to track -> train is tripped -> driver and traffic operator do not understand what happened -> train moves in Release Speed Monitoring and passes signals/points -> RBC and interlocking lose synchronization -> Movement authority is sent to wrong train -> danger -> driver notices the error and stops, no accident.

This happened on ETCS L2 lines on 16.04.2019 in Flüelen and on 27.06.2019 in Vevey. Corrective measures were taken soon after so that the risk could be reduced to an acceptable level. Definitive measures are still investigated by SBB with the suppliers. According to our information, Thales has analysed all relevant Thales equipped lines and informed the concerned IM's.

Country

Switzerland

Issuer

NSA

Issuing Date

16/04/2020



Safety incidents on ETCS Level 2 lines in Switzerland on April 16th and June 27th 2019

Date:	16.04.2020
To:	SIS ERA
Copy to:	SPR, fz, st, su

File reference: BAV-503.233-2/1/1

A detailed analysis of two incidents is currently on-going involving the Swiss Federal Railways (SBB), the Swiss Federal Office of Transport (FOT) and the suppliers of the On-Board-System (OBS) and the Radio Block Centre (RBC). A notification to ERA was sent on the 12th of July 2019.

The following description outlines the main events common to both incidents:

- 1) During maintenance activities important odometer parameters were configured incorrectly. Neither the applied process nor the OBS revealed the error.
- 2) As a consequence, the ETCS OBS experienced a substantial loss in precision of the distance measurement functionality.
 - The reported confidence interval of the positions of the trains did not meet the given performance requirements and exceeded the threshold permanently by a large factor outside the acceptable tolerance according to Subset-41 §5.3.1.1.
 - Even in the light of this implausible sensor measurement data leading to the growth of the confidence interval, there was no adequate reaction from the OBS.
- 3) The train continued movement in Full Supervision (FS) mode and accepted and confirmed a Conditional Emergency Stop (CES) although the train had already passed the emergency stop location.
 - As a result, the Movement Authority (MA) was shortened by the OBS to the emergency stop location.
 - The train braked until standstill without trip reaction.
- 4) After the train reported its MA as shortened, trackside issued a new MA which allowed the train to closely approach the virtual signal, situated 75m after the emergency stop location. Since the actual train front end was already beyond this virtual signal at this moment, no movement was allowed at all.

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- 5) The estimated and max safe front ends were located beyond the virtual signal and therefore beyond the End of Authority (EoA). This resulted in the expected OBS behaviour:
 - The supervision of the EoA by max safe front end resulted in allowed speed "Release Speed" (operator's choice in Switzerland).
 - On the on-board Driver Machine Interface (DMI), the safe speed indication was shown as zero. The Release Speed was indicated with 20km/h.
 - The on-board DMI showed that there was no more distance to the target (EoA).
 - The on-board DMI indicated an empty planning area.
- 6) The train was set in motion again and continued moving in Release Speed.
- 7) This movement was still not allowed (see 4), therefore the train was expected to trip as soon as the min safe front end passed the EoA. However, the train continued moving without performing a trip reaction. The trip reaction was not performed because the min safe front end had still not passed the EoA at the virtual signal due to an unexpected large deviation of the train positioning function, as indicated in step 1.
 - In case the passing of the EoA would have been correctly supervised with the min safe front end by the OBS, a trip reaction would have been the consequence.
 - In case the driver would have been aware of the fact that the train is moving in Release Speed under full responsibility of the driver and beyond its authorisation, the driver would not have set the train into motion again.
 - The train was hence moving without any authorisation in FS mode outside of a valid MA.
 - The train OBS still considered its position to be before the EoA, i.e. the train would accept a next CES for a stop location at or before the virtual signal.
- 8) Moving away from its MA without relevant authorisation, the train cleared routes and switches. Now it was possible for the interlocking to use the track for new routes over the other leg of a cleared switch. Since the OBS (see 7) still reported to be inside its MA, this MA was extended over the newly set route, and the extension was communicated to the train.

Graphical description

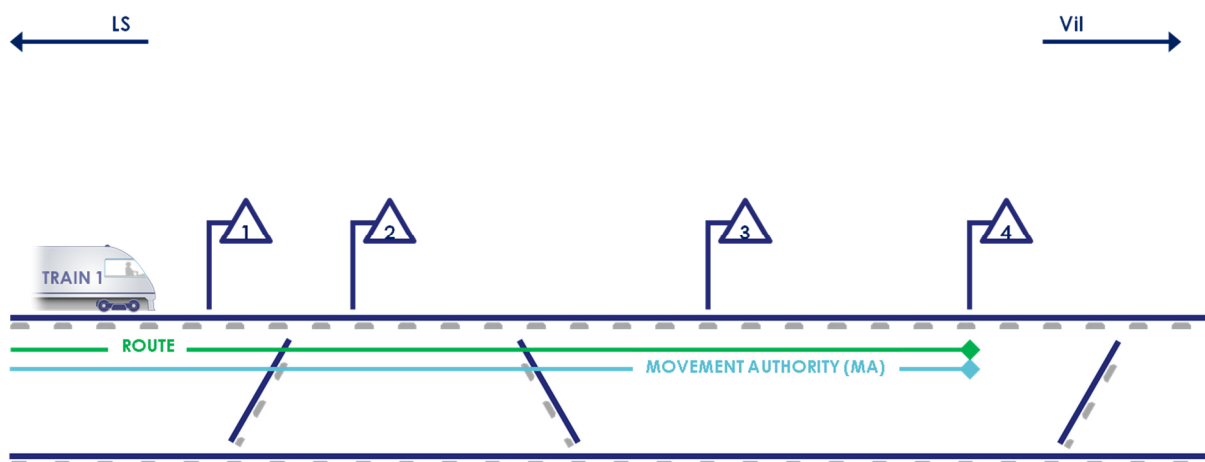


Figure 1

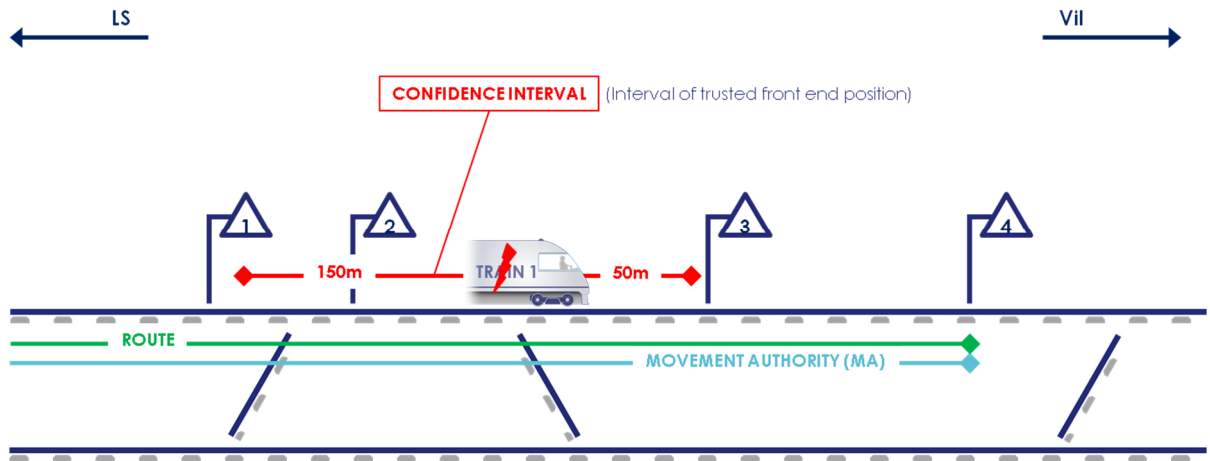


Figure 2

- Train 1 runs from LS to VIL. (set route is indicated in green, MA is indicated in blue).
- All signals have release speed (Figure 1)
- Train 1 shows a large confidence interval (indicated in red) (Figure 2)
- Section between Signal 2 and 3 is occupied by train 1, min SFE remains in front of Signal 2 (Figure 2/3)

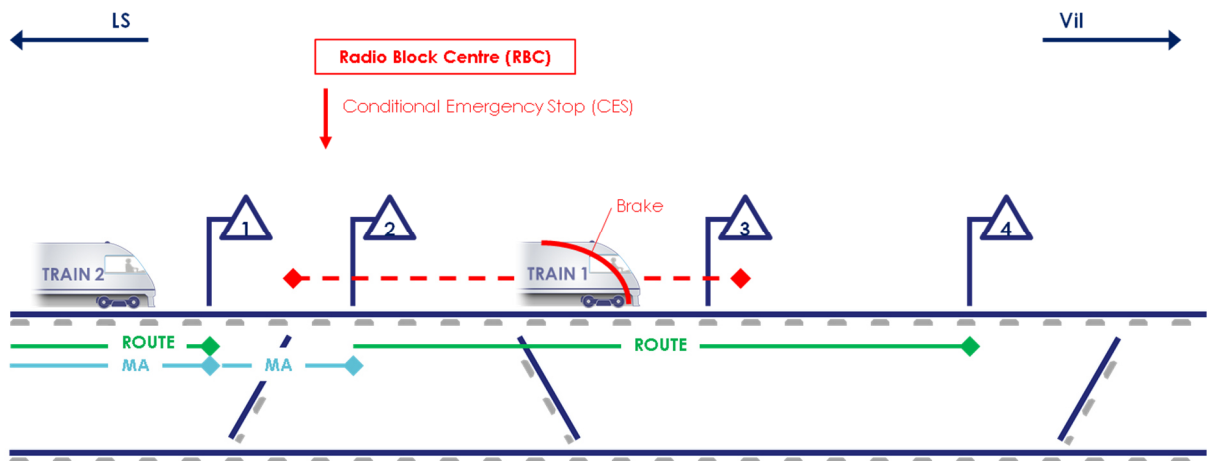


Figure 3

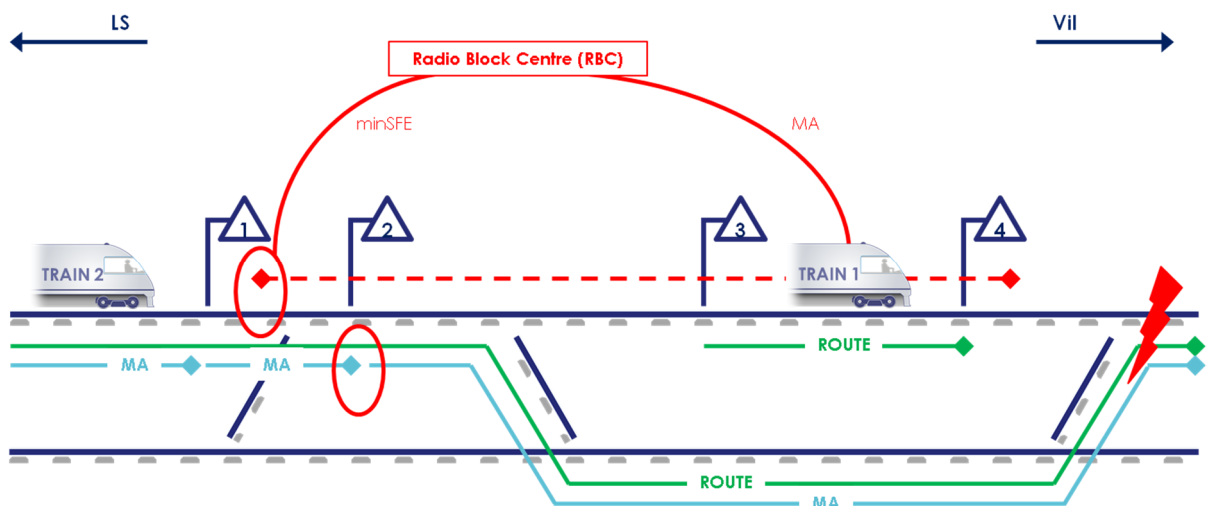


Figure 4

- Due to the function “signal stop evaluation” (1), a new MA of train 1 is sent with EoA at signal 2 (Figure 3)
- Train 1 proceeds (with RS), min SFE remains in front of signal 2. No trip occurs.
- Train 2 approaches signal 1 (Figure 3)
- Route for train 2 is set (to pass by train 1) (Figure 4)
- From RBC point of view train 1 (due to minSFE) is still in front of signal 2 (Figure 4)
- The MA based on the route set for train 2 is assigned to train 1 which leads to a critical situation (Figure 4)
- (1): by passing a signal and the occupation of the section, a CES is sent to the train at a location 75m in advance. If the CES is considered, a new MA with a EoA at this signal is sent to the train (Figure 4)

The above described chain lead ultimately to a reaction of the RBC to issue a MA to the train that had gathered a significant inaccuracy in its position.

In both incidents all systems and sub-systems individually behaved according to the UNISIG specifications. Nevertheless, in combination with human error on maintenance and Release Speed recognition, the two incidents clearly showed that a safety critical situation can occur.

Though a sufficiently safe technical solution should come from the OBS and/or the DMI, besides other measures the supplier of the RBC has been requested expressly by FOT and supported by SBB to add functionality to the RBC.

This requested functionality within the RBC should monitor the confidence intervals of the various ETCS Level 2 OBS in operation in accordance with the threshold defined by the Operator. If the confidence interval of a given ETCS Level 2 OBS would exceed this threshold, the RBC should initiate an adequate reaction to maintain the overall system safety.

This functionality is to be understood as an additional sanity check for the positioning of moving trains. All parties agree that depending on the performance of the positioning capabilities of the OBS this eventually can lead to reductions in operational performance, until UNISIG performance requirements are adequately achieved by all ETCS Level 2 OBS.

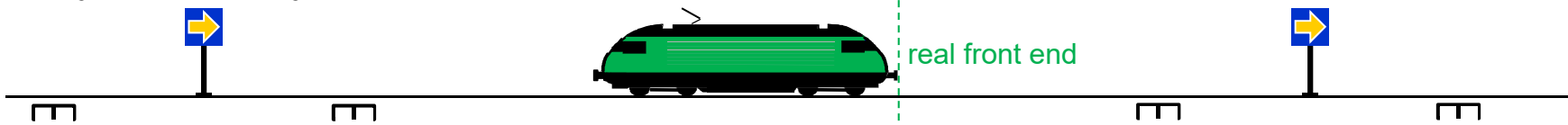
Additional short term preventive measures should be:

- a review of the maintenance procedures for ETCS Level 2 OBS to ensure that incorrect odometer data are identified before train release and,
- a restricted use of Release Speed handling combined with clear instruction and application of the operational scenarios where Release Speed is available.

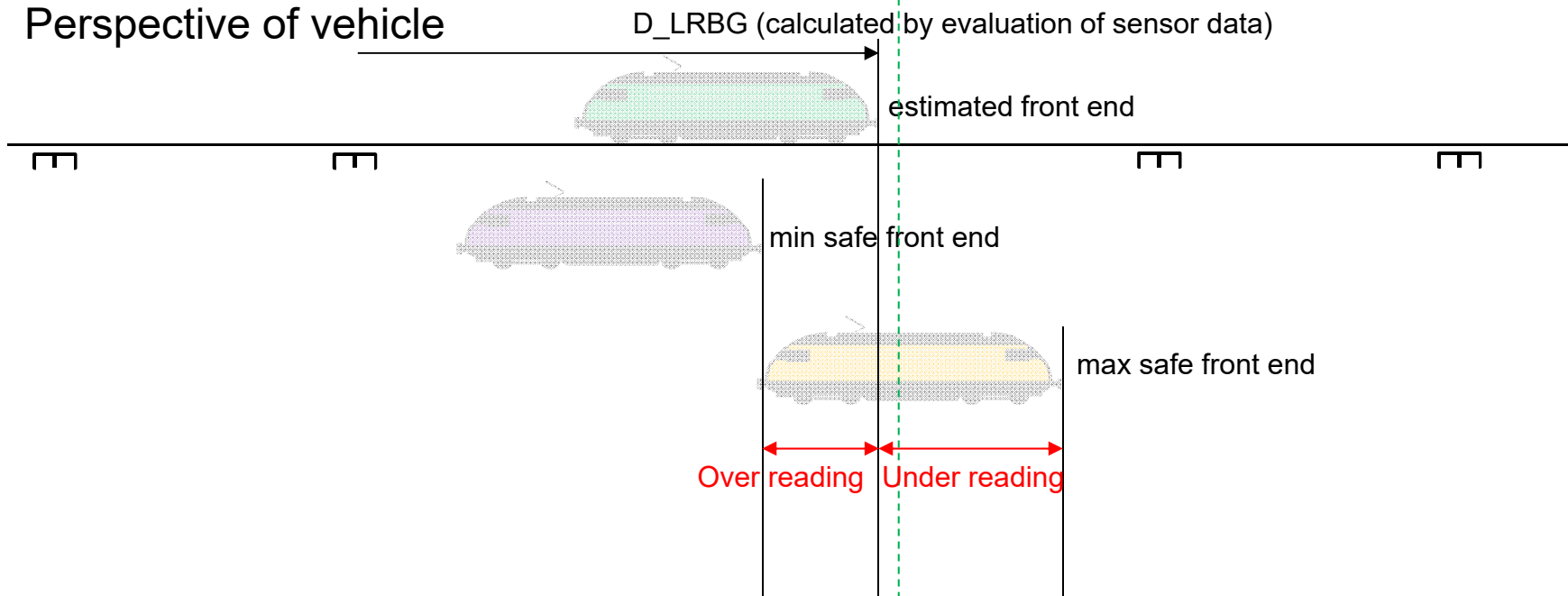
In case you have further questions please feel free to contact the undersigned

ETCS Odometry

Physical reality



Perspective of vehicle

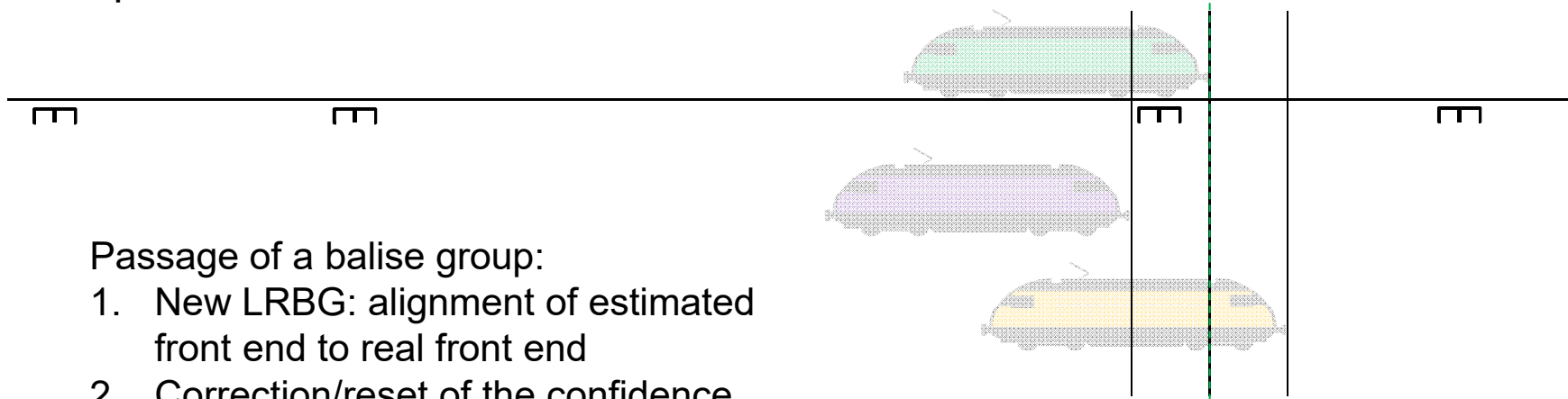


Passage of a balise group

Physical reality



Perspective of vehicle



Passage of a balise group:

1. New LRBG: alignment of estimated front end to real front end
2. Correction/reset of the confidence interval (location accuracy of the BG + small tolerances)

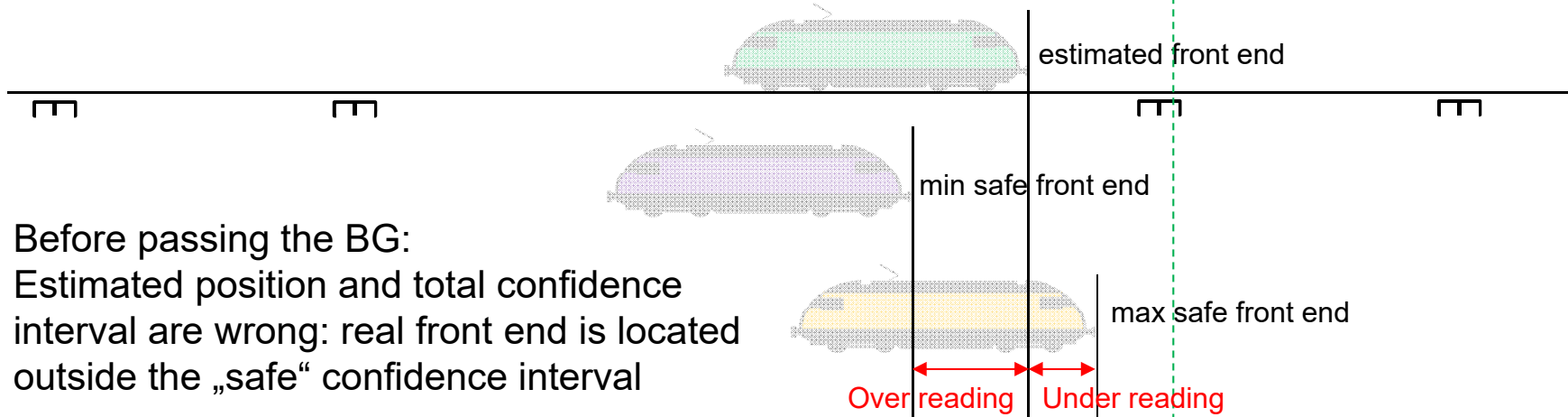
Accurate DMI and supervision when signal corresponds to an end of authority EoA

Odometry fault: Real front end outside conf. interval

Physical reality



Perspective of vehicle



Before passing the BG:
Estimated position and total confidence interval are wrong: real front end is located outside the „safe“ confidence interval

Tolerable hazard rate for ETCS onboard: ca. $10^{-9}/h$ (SIL 4); SUBSET-091, V2.5

Fulfilling the requirement would roughly allow 1 event every 1000 years on L2 lines in CH

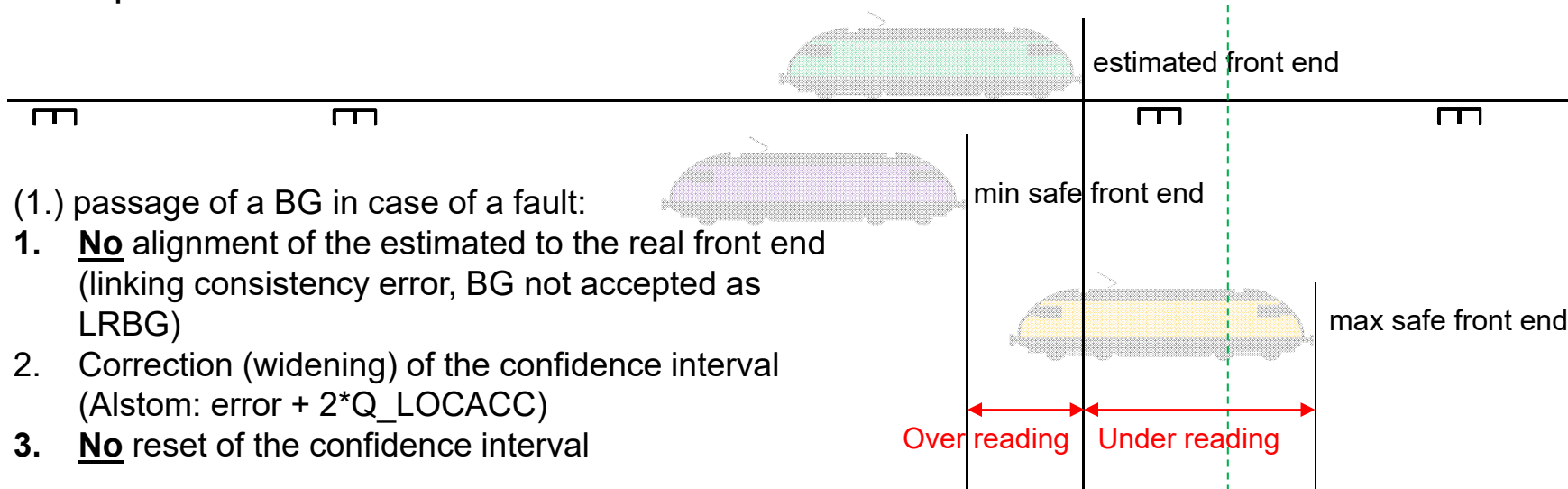
Observations/Monitoring: **100+ events per year**

Odometry fault: Passage of balise group

Physical reality



Perspective of vehicle



(1.) passage of a BG in case of a fault:

1. **No** alignment of the estimated to the real front end (linking consistency error, BG not accepted as LRBG)
2. Correction (widening) of the confidence interval (Alstom: $\text{error} + 2 \cdot Q_LOCACC$)
3. **No** reset of the confidence interval

Supervision and timely issue of EB not possible when driver surpasses EoA in RS
Danger point behind the signal is reached with high probability unless overlap is large

Rolling stock -
other

<i>Equipment</i>	ETCS On-Board System (OBU) from Alstom, version GATC 5.7.1 with Speed and Distance Measurement Unit (SDMU) version MK1, GATC 4.9.0.A5+ and possibly other
<i>Description</i>	<p>In dedicated situations, the SDMU calculates a confidence interval (CI) which is too small – i.e. the real front end is physically located outside of the safe confidence interval CI. If occurring, a dangerous condition may follow, because the CI is not reset/corrected at the passage of a balise group (linking consistency error) before a signal being the End of Authority (EoA). In areas with cab signalling, when the driver erroneously surpasses this signal in Release Speed Monitoring (the distance to target displayed on the DMI may also be inaccurate), the emergency brake (EB) triggered at passing the EoA with the min safe front end may no longer be sufficient to stop the train in front of the danger point. In first approximations, the Tolerable Hazard Rate THR attributed to ETCS_OB01 (SUBSET-091) corresponding roughly to SIL 4 (1E-09/h) is exceeded by a factor of 1E05 and is therefore no longer fulfilled.</p> <p>Deviations of the sensors (radar, wheel sensors, accelerometer) are not correctly managed by the SDMU. A wrong calculated CI may be identified as hazard event KERNEL-28 (Incorrect confidence interval) and/or ODO-4 (distance measurement is incorrect) in SUBSET-088 and SUBSET-091.</p>
<i>Country</i>	Switzerland
<i>Issuer</i>	NSA
<i>Issuing Date</i>	01/05/2020

Infrastructure -
signalling system

<i>Equipment</i>	Processing of immediate level transition for ETCS onboard.
<i>Description</i>	<p>Alstom has detected that its current ETCS OBU versions 6.4.x to 6.9.x and 7.0.x. in relation with Baseline 3 do not exhaustively cover all possible cases for immediate level transition.</p> <p>There are conditions possible that a driver leaves a shunting area while still in shunting mode.</p> <p>See attached file for a more precise description of this issue.</p>
<i>Country</i>	Netherlands
<i>Issuer</i>	NSA
<i>Issuing Date</i>	28/04/2020



BELGIUM

Signalling

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Charleroi, April 27th 2020

Dear Madam, dear Sir,

Subject: processing of Immediate Level Transition for ETCS onboard

ALSTOM has detected that its current ETCS OBU versions 6.4.x to 6.9.x and 7.0.x in relation with Baseline 3 do not exhaustively cover all possible cases for immediate level transition (LTI).

On that basis, we would like to inform you about the potential behavior that may be encountered.

The ETCS specification foresees that the request for level transition (Packet 41) includes a parameter to define at which distance the transition shall take place (D_LEVELTR). A special value "NOW" is defined in case of immediate transition. For other cases, the D_LEVELTR parameter indicates at which distance the transition shall take place. However, the specification also allows the use of "D_LEVELTR = 0" to indicate an immediate transition. Our ETCS OBU properly executes all requirements associated to immediate level transition when the parameter "NOW" is used, but not if "0" is used.

In that case, if

1. The EVC is operating in mode Shunting, level 0 or NTC, and
2. an immediate level transition order to level 1/2/3 is received, and
3. the D_LEVELTR parameter is set to "0" and not "NOW", and
4. "Danger for Shunting" information (packet 132) is received together with the level transition order, then the "Danger for SH" information is erroneously rejected.

Under such conditions, the drivers might potentially leave a shunting area while still in shunting mode.

We confirm that such behavior can only be observed for the specific combination described above which, to our knowledge, does not correspond to expected engineering rules of ETCS infrastructures. We also confirm that for all infrastructure projects delivered by Alstom the parameter D_LEVELTR is set to "NOW" in case of immediate level transition requests.



From previous similar situations, the proposed mitigation, if needed, has always been allocated to the lineside equipment. In this particular case, it would correspond to the application of the expected engineering rule in trackside equipment (LEU or balise), or operational procedures.

The attached flowchart enables to assess if the potential risk to leave a shunting area while still in shunting mode exists or not.

Should the potential risk be present, our suggestion to avoid any hazard is to adapt the procedure for requesting immediate level transition by using the special reserved value "NOW" for the D_LEVELTR parameter.

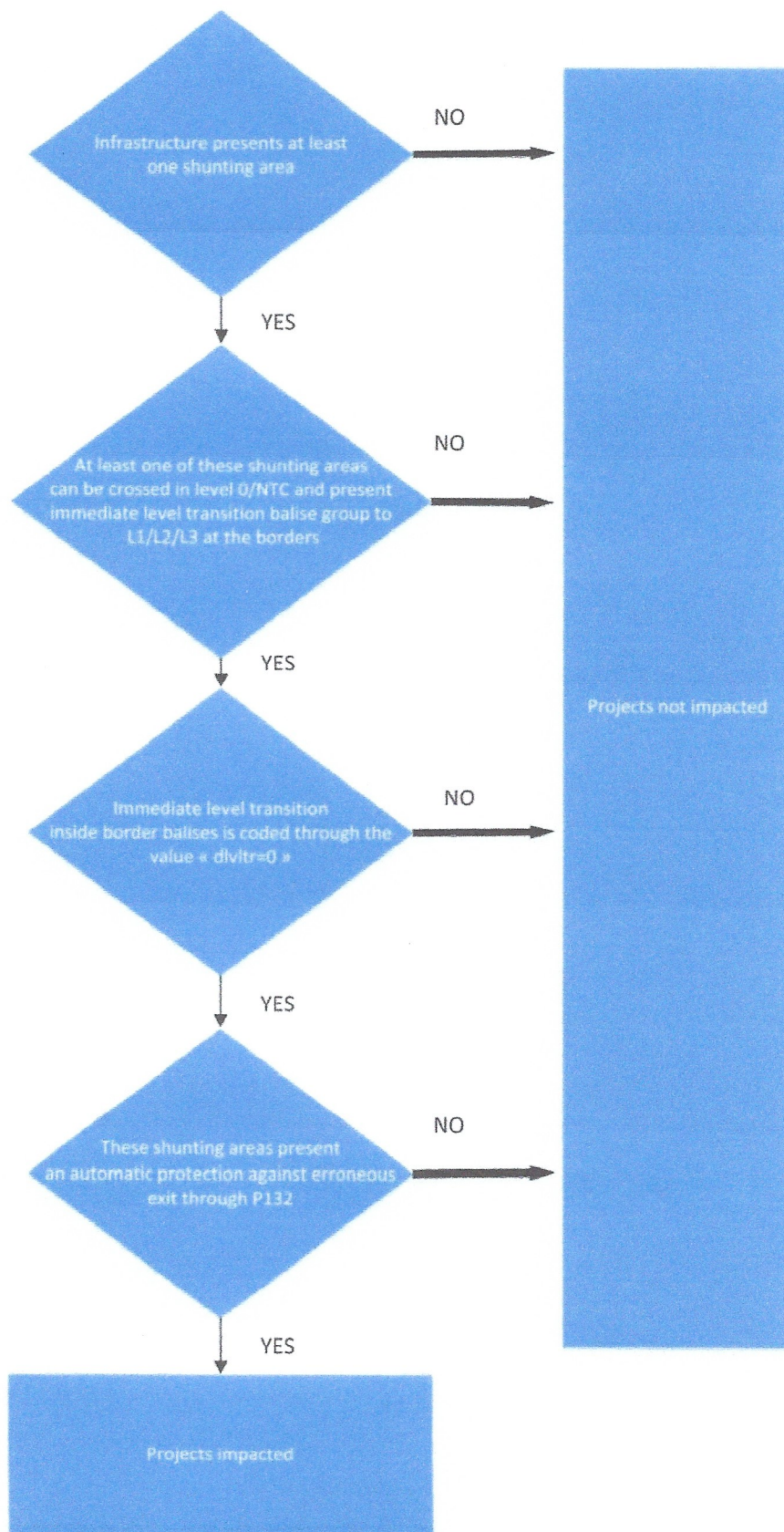
We kindly ask you to forward to and clarify the applicability of this issue with all ETCS Infrastructure Managers under your area of responsibility and also for future ETCS installations. Please provide us with the result of the clarification as soon as you can.

We trust we have informed you duly and remain available should further clarification be required.

Yours faithfully,

Christine MAGAIN
Quality & Global Performance Director

Vincent PASSAU
ATLAS Solution Director



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Sicurezza delle Ferrovie
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Bologna, 04 Maggio 2020
Rif. 2647

Oggetto: comunicazione relativa al potenziale rischio per la sicurezza del Costituente d'interoperabilità EVC dei bordi Alstom ERTMS con versioni Baseline 3

In merito alla notifica relativa al potenziale rischio per la sicurezza del Costituente d'interoperabilità EVC dei sottosistemi di bordi Alstom ERTMS con versioni Baseline 3 riportata nella comunicazione allegata – trasmessa da Alstom Belgium s.a. in data 27/04/20 – **Vi comunichiamo che non sussistono azzardi per l'operatività dei sottosistemi di bordo Baseline 3 di Alstom Ferroviaria S.p.A. con le condizioni di utilizzo attualmente già previste ed autorizzate.** Di seguito si riportano le considerazioni a supporto.

Lo scenario di azzardo prevede che il bordo Baseline 3 sia in modalità Shunting (manovra), in livello 0 o NTC (STM) e che riceva contemporaneamente:

- a) il pacchetto 41 di ordine transizione immediato a livello 1/2/3 con parametro D_LEVELTR uguale a "0",
e
- b) il pacchetto 132 ("Danger for shunting").

In questa situazione, l'informazione "Danger for SH" è indebitamente rigettata dal Bordo Baseline 3 per l'effetto di a)+b), che non effettua la transizione di livello e quindi il veicolo potrebbe inoltrarsi in un area ERTMS fuori dalla zona di Shunting, sempre in modalità SH (manovra).

Tale condizione di azzardo non si manifesta se i sottosistemi CCS di terra ERTMS sono configurati con la variabile D_LEVELTR= NOW (32767).

Da una pronta indagine interna, ALSTOM Ferroviaria S.p.A conferma che i sottosistemi di terra di propria fornitura sono attualmente configurati con la variabile D_LEVELTR=NOW (32767) e pertanto non sussistono azzardi per l'operatività dei Bordi Baseline 3 su queste terre ERTMS.

La situazione di applicabilità per i sottosistemi di bordo è quella di seguito rappresentata:

- tutta la flotta di rotabili Alta Velocità, equipaggiata con il sottosistema di bordo Alstom Ferroviaria S.p.A, attualmente autorizzata, ha costituente d'interoperabilità EVC conforme alle specifiche Baseline 2 e quindi **non è oggetto di alcun rischio potenziale.**



- le applicazioni ERTMS E464 e ERTMS UIC Z1 con costituente d'interoperabilità EVC conforme alle specifiche Baseline 3 MR1 hanno autorizzazione all'esercizio commerciale ed operano essenzialmente nelle linee regionali in modalità L_NTC. L'attuale autorizzazione su terra ERTMS è limitata esclusivamente al passante AV Firenze-Bologna compreso tra Bologna Centrale AV km 0+000 e PM Reno sino al confine di changeover km 8+264 (ad esclusione delle interconnessioni di Bivio Venezia e S.Viola) attrezzato con CCS di terra di Alstom. **Non sussistono pertanto azzardi per l'operatività dei sottosistemi di bordo Baseline 3 di Alstom Ferroviaria S.p.A..**

Distinti saluti.

Simonluca Meletti
Trainborne Director

Allegati:

- *Comunicazione ANSF*
- *Alstom - 8D 158976 Immediate Level Transition - Communication*