Translation of an excerpt of the investigation report

“Train collision Meinersen station – Leiferde (b Gifhorn) halt, on 17/11/2022”

Status as of 04/02/2025, version 1.1.

Note:

In accordance with Article 3 of Implementing Regulation (EU) 2020/572, points 1, 5 and 6 of Annex I of an investigation report shall be written in a second official European language. This translation should be available no later than three months after the delivery of the report.

The following English translation is a corresponding excerpt of the investigation report. The German language version is authoritative.

Excerpt translation:

1 Summary

The first section contains a brief description of the event, as well as information on the consequences, primary causes and safety recommendations provided in the individual case.

1.1 Brief description of the event

On 17/11/2022 at around 3:26 am the freight train DGS 42593, which was travelling from Antwerpen-Noord (Belgium) to Köthen central, collided with freight train DGS 90977, which was stationary in front of block 86 of the continuous automatic train control (ATC) system, between Meinersen station and Leiferde (b Gifhorn) halt.

1.2 Consequences

The train driver of freight train DGS 42593 suffered minor injuries during the collision. Material damage with an estimated value of around EUR 4,000,000 was caused.

1.3 Causes

During the investigation of the event, the following actions, failures, incidents or circumstances were identified as safety-critical factors. In accordance with Implementing Regulation 2020/572, these are classified into causal or contributing and systemic factors.

A detailed assessment of the event, with classification as safety-critical factors, is provided in the sections below.

The safety-critical factors are assigned a short designation to allow for direct assignment. The letter F and a sequential number is added to each causal or contributing factor. Example: [F1]. Corresponding systemic factors are assigned the letter S with the same number; in this case, further differentiation may be required using a lower case letter. Example: [S1a] and [S1b] to [F1].

Identified aspects that impaired the speed or efficiency of the emergency management after the occurrence of the event, and as a result increased the extent of the damage, are indicated with the letter N and sequential numbers. Example: [N2].

What happened: Date/time, and action/failure/circumstance/incident	Causal factor	Contributing factor	Systemic factor
17/11/2022 / 3:16 am Continuous ATC system transmission failure with message no. 333 for train DGS 42593.	[F1] Continuous ATC system transmission failure for train DGS 42593 with unknown technical cause	-	[S1] Appropriateness of the information channels in relation to the performance level of the continuous ATC system
17/11/2022 / 3:21 am Instruction to continue the journey issued in spite of missing findings from the individual clearance inspection.	[F2] Signaller performed the individual clearance inspection incorrectly and missed the fact that the block section to be inspected was occupied	-	[S2a] Operational reliability of the signaller during the individual clearance inspection. [S2b] Fully risk-oriented competence management

What happened: Date/time, and action/failure/circumstance/incident	Causal factor	Contributing factor	Systemic factor
Part of the initial situation Representation and identification of the route section in the magnified view of the signaller's operator station.	-	[F3] Display ergonomics in order to support decision for individual clearance inspection	-
Part of the initial situation No classification of command 10 and 10.1 as travel with special instruction within the train operating regulation guideline 408.	-	[F4] No classification of command 10 and 10.1 as travel with special instruction within guideline 408	-
17/11/2022 / 3:23 AM Driver of DGS 42593 continues his journey, exceeding the v_{max}.	-	[F5] Excessive collision speed meant that more damage was caused	-
17/11/2022 / 3:30 AM Signaller's conduct in the event of danger.	-	[N6] Delayed process of the emergency management steps contributing to external rescue measures	-
17/11/2022 / 3:28 AM DGS 90977 driver's conduct in the event of danger.	-	[N7] Lack of emergency stop instruction contributing to external rescue measures	-

Table 1: Summary of influencing factors

1.4 Safety recommendations

The following safety recommendations are issued in accordance with Section 6 of the Eisenbahn-Unfalluntersuchungsverordnung (EUV, German railway accident investigation regulation) and Article 26(2) of Directive (EU) 2016/798.

No.	Addressee and safety recommendation	Relates to company
04/2025	Safety authority: In order to reinforce the risk-oriented approach in all phases of competence management, it is recommended that the procedures for maintaining and updating safety-related knowledge and skills should be inspected in a workplace-specific manner and improved if necessary. This must include the activities of employees with safety-related roles and managerial tasks at all relevant levels (Regulation (EU) 2018/762, Annex II, points 4.2.1 and 6.1.1 a)).	DB Netz AG (renamed as DB InfraGO AG)
05/2025	Safety authority: It is recommended that obligatory statutory communication channels and reporting paths in the management systems of the infrastructure manager, railway undertaking and ECM should be developed/improved with the aim of all parties involved jointly reducing the frequency of continuous ATC system transmission failures. (Relating to railway undertaking: Regulation (EU) 2018/762, Annex I, point 4.4.1; infrastructure manager: Regulation (EU) 2018/762, Annex II, point 4.4.1; ECM: Regulation (EU) 2019/779, Annex II, point 7.1)	Infrastructure manager, railway undertaking, ECM

5 Conclusions

The following section contains a summary of the identified causal, contributing and systemic factors. In addition, two further subsections are provided containing information about measures already taken, and additional comments

5.1 Summary and conclusion

The actions, failures, incidents or circumstances around the time of the event described in this investigation report resulted in the train collision between Meinersen station and Leiferde (b Gifhorn) halt.

The Federal Authority for Railway Accident Investigation identified two causal, three contributing and three systemic factors that influenced the event. Furthermore, two factors were highlighted in relation to emergency management processes after the occurrence of the event.

In relation to the causal factor "Continuous ATC system transmission failure for train DGS 42593 with unknown technical cause" [F1]:

During the development of the continuous ATC system, a safety reaction was implemented in the continuous ATC system, according to which the defined status "continuous ATC system transmission failure" can be used and the train can be stopped in order to account for influences on the functions of the continuous ATC system that cannot be excluded during operation. This was initially the case for the DGS 42593. Using this kind of technically defined operating status allows for the controlled observance of the fundamental operational principle of the TSI OPE mentioned in section 4.1.1, according to which the procedure for permitting a train journey must ensure a safe distance between the trains. When the train is stopped due to the safety reaction of the continuous ATC system, a safe distance to the train in front is first established.

In order to continue operation, procedural rules were applied, some of which were technically supported but most of which were organisational and to be implemented by the signaller. This should mean that operations can be continued in such a way that in the fallback level no train that is now signal-controlled enters or moves onward in a block section still occupied by other train journeys. In the fallback level, a safe distance between the trains is guaranteed until passing at the next main signal as a signal-controlled train in the event of correct application

of the rules stipulated in guideline 408. This means that the TSI OPE requirement is also continuously met.

The investigations showed that, as the result of a continuous ATC system transmission failure, the high performance level of the continuous ATC system achieved via automation may be impaired at selected points in relation to reliably ensuring the distance between two trains. This applies for incidents in which the sole display management via the continuous ATC system temporarily no longer allows for safe operational management due to technical influences. Accordingly, the avoidance of these technical influences is also significant for the performance level of the continuous ATC system, because when there is any continuous ATC system transmission failure in the partial block mode, the operation is continued in fallback levels and therefore temporarily with a reduced safety level.

In relation to the specific event, according to DB Netz AG there was no conspicuous accumulation of continuous ATC system transmission failures in system section zone 74 and location within zone 3 of channel 4 “track 67”, which has been defined as the relevant unit, and/or the linked track of the affected line section.

It is true that the technical influences on train protection preceding the continuous ATC system transmission failure were roughly logged automatically with the infrastructure manager. However, during the Federal Authority for Railway Accident Investigation’s enquiries, it was not possible to make conclusions about the circumstances of the individual case in terms of the design and operation of the continuous ATC system vehicle equipment of the DGS 42593 train.

Using appropriate encoding, it would have been possible to perform more in-depth diagnosis in consideration of the train’s operating parameters and the on-board systems at the time of the continuous ATC system transmission failure. However, the railway undertaking and the ECM did not provide any information about related activities.

In relation to the systemic factor “Appropriateness of the information channels in relation to the performance level of the continuous ATC system” [S1]:

The investigations showed that a systemic factor [S1] can also be assigned to the causal factor “Continuous ATC system transmission failure for train DGS 42593 with unknown technical cause” [F1]. A continuous ATC system transmission failure impairs the performance level of the continuous ATC system. The operations temporarily continue in the fallback level for

signal-controlled trains and require increased human involvement in order to control the safe distance between two trains. Accordingly, the risk of dangerous events increases.

However, it is possible to influence the probability of occurrence if existing findings about continuous ATC system transmission failures are used to improve the maintenance or the design/integration of the continuous ATC system components into the equipment.

The explanations from the infrastructure manager during the investigation process indicated that, in relation to the railway undertaking and ECM, there are currently no systematically operated communication channels for structured and regular forwarding and analysis of the data logged on the track side about the continuous ATC system for vehicle-side diagnostics.

It is true that it was reported that within the Deutsche Bahn AG Group findings about conspicuous accumulations of continuous ATC system transmission failures are exchanged between the infrastructure manager DB Netz AG and the Group-owned railway undertakings or their parallel role as ECM. In individual cases, this has resulted in improvements in relation to types of train or continuous ATC vehicle systems used within the Group. However, cooperation with the manufacturers of the vehicles and systems is also needed during this process.

In addition, a pronounced culture of open cooperation between all interested parties in the sector seems to be required.

On the part of the railway undertaking Crossrail Benelux N.V., no information has been provided about activities in relation to the train involved in the event and its continuous ATC vehicle systems that could be used to diagnose the continuous ATC system transmission failure. The Federal Authority for Railway Accident Investigation was also not shown how a systematic approach to any such diagnosis is used by the railway undertaking, keeper and ECM.

From the perspective of the Federal Authority for Railway Accident Investigation, it must be noted that no reliable processes were demonstrated during the investigation pertaining to fulfilling the requirements as per Regulation (EU) 2018/762, Annex I, point 4.4.1 for the railway undertaking to have adequate communication channels with other interested parties relating to diagnosis of continuous ATC system transmission failures.

From the railway undertaking's statements, it was not possible to conclude whether interfaces had been established to stipulated reporting paths within the interested parties. The vehicle owner Alpha Trains Luxembourg S.à r.l. stated *"that the reporting paths are stipulated and documented by the 'Master Lease Agreement' and the 'Lease Confirmation'."*

In all, the abilities of the railway undertaking and ECM to investigate continuous ATC system transmission failures already remain restricted if no communication channel is established or can be operated starting from the infrastructure manager and its sources for relevant diagnosis information. However, a channel of this nature seems to be needed based on the requirements for the infrastructure manager as per Regulation (EU) 2018/762, Annex II, point 4.4.1.

In summary, the picture emerges that cooperation between all interested parties can be increased in relation to the continuous ATC system, which it is envisaged will still be used for the foreseeable future in the German railway network, in order to improve safety. Examples like those highlighted by the infrastructure manager DB Netz AG prove that this can be successful.

Due to the statutory requirements for the safety organisation, there is already an obligation for infrastructure managers, railway undertakings and ECMs to have appropriate communication channels and/or define reporting paths. However, the circumstances identified due to the train collision show that the possible information process is not continuously and extensively established, even though the infrastructure manager and railway undertaking operate the continuous ATC system together, and also that the maintenance by the ECM, and the design and integration improvement by manufacturers, are also important in this regard.

The Federal Authority for Railway Accident Investigation is therefore issuing safety recommendation No 05/2025 to develop/improve the communication channels and reporting paths, which are already required by law, in the management systems of the infrastructure manager, railway undertaking and ECM with the aim of all parties involved jointly reducing the frequency of continuous ATC system transmission failures.

From the perspective of the Federal Authority for Railway Accident Investigation, it also appears to be beneficial for the authorities responsible for supervision, approval and regulation to support the promotion of a sector-wide approach, for example, relating to the

exchange of information between infrastructure managers and railway undertakings, as well as involvement of manufacturers of approved continuous ATC system components.

In relation to the causal factor "Instruction to continue the journey in spite of the individual clearance inspection criteria not being present" [F2]:

The investigations indicated that the fact that the responsible Fallersleben West signaller did not adequately perform the required individual clearance inspection as per guideline 408.0241 section 4, and therefore the freight train DGS 42593 was allowed to continue into a block section still occupied by two other freight trains, was also a causal factor for the event.

In relation to this causal factor, the investigations identified two associated systemic factors [S2a] and [S2b], which influenced the event.

In relation to the systemic factor "Operational reliability of the signaller during the individual clearance inspection" [S2a]:

The investigations showed that the infrastructure manager does not have any guidelines for the working process in relation to an individual clearance inspection in order for the user of guideline 408 to

- correctly transfer the functional operating rules to the failure scenario and their location,
- subsequently make an error-free assessment, and
- only then take working steps dependent on this assessment, such as issuing a command 10.

Following the investigation, the Federal Authority for Railway Accident Investigation held talks about this with technical supervisors from the infrastructure manager. These talks showed that there is awareness within the company about the great importance of conducting an individual clearance inspection correctly. The ability to always perform an individual clearance inspection without errors is one of the basic requirements for the role of a signaller.

Nonetheless, when transferring the rules to an individual failure scenario, appropriate structuring of the work process could help the people doing the work to reliably conduct the correct assessment of the criteria for an individual clearance inspection, even when under stress or subject to influences such as tiredness. The people doing the work should then also

be actively guided in the work process in order to perform the individual clearance inspection successfully before adding further work steps, such as approving a following journey.

All measures that verify the correct performance and sequence for a work process of this kind will be considered as supporting measures in this area. These could include, for example, check-lists to be managed manually, information or implemented interactions provided in user interfaces and/or completion constraints using a timestamp function. From the perspective of the Federal Authority for Railway Accident Investigation, for example, this kind of improvement to work processes must not be impeded by the fact that measures of this kind to verify the correctness and sequence of the work processes are generally not implemented because the corporate work seems to be too high or cannot be generalised due to different locations or signalling systems. As a minimum, common screen-supported operator stations could be equipped with these expanded functions in the near future.

Due to the repeated deficiencies identified in competence management at the infrastructure manager [S2b], however, these will take priority as the subject of a safety recommendation.

In relation to the systemic factor "Fully risk-oriented competence management" [S2b]:

The investigations by the Federal Authority for Railway Accident Investigation showed that the contents of the open training talks when conducting the operational checks for the signaller were a systemic factor within the event.

According to the infrastructure manager's guidelines, the contents of the training talks could be freely selected. They were obviously not based on risk-critical activities within the workplace at the Fallersleben operator station. Accordingly, the success of this tool for identifying deficiencies in competences as part of the supervision was left to chance. The area manager for operations, who is responsible for the training talks, was also not monitored by the authority designated by the safety management system process when carrying out the work, meaning that corrective measures could not be introduced and also were not introduced by the infrastructure manager at any level.

In relation to the performance of the regular further training for the signaller, it became clear that the measures implemented for training on safety-related processes at the operator station were carried out without reference to issues related specifically to the continuous ATC system.

As a result of this approach, the infrastructure manager did not ensure that the basic, mandatory knowledge and skills imparted to the signaller in relation to dealing with high-risk actions at Fallersleben West operator station were permanently available according to the requirements for the classification of her job in functional level “A” as per guideline 412.9111 section 4(3). In the organisation of the infrastructure manager, there was no way of ensuring that a loss of previously acquired competences would be identified in good time in order to take measures.

As a whole, it must therefore be recorded that there were deficiencies in competence management at the infrastructure manager in relation to the operator gaining and maintaining knowledge and senior supervisors initiating corrective measures. According to Delegated Regulation (EU) 2016/762 Annex II point 4.2.1e), this kind of regular assessment of competence and ensuring that qualifications and skills are maintained over time are part of competence management. In this case, competence management is particularly important in ensuring that high-risk activities are carried out safely at all times. As is evident, this relates to more than just the directly superior managers.

Due to the findings, the Federal Authority for Railway Accident Investigation is issuing safety recommendation No 04/2025 in order to reinforce the risk-oriented approach in all phases of competence management to inspect and, if necessary, improve the procedures for maintaining and updating safety-related knowledge and skills in a workplace-specific manner. This process must include the activities of employees with safety-related roles and with managerial tasks at all relevant levels.

In relation to the contributing factor “Representation and identification of the route section in the magnified view of the signaller’s operator station” [F3]:

It is possible that the signaller only checked whether block section 90, which was immediately in front of the DGS 42593 after the continuous ATC system transmission failure, was free, instead of checking whether the entire block section in front of the DGS 42593 up to block signal 502 of Leiferde (b Gifhorn) crossover was free as per the regulations. It is only possible to speculate about the extent to which the fact that the route section was displayed beyond the edge of monitor 8 facilitated this flawed assessment by the signaller. At the time of transmitting command 10 and 10.1 to the DGS 42593 driver, block section 90 in front of the DGS 42593 was illuminated green, meaning it was free. This identification of the DGS 42593

as part of the driver's location report took place on monitor 8 in the connected magnified view "L_HMRS1". If the signaller had inspected beyond the edge of the monitor onto monitor 9, where the route section continued, as part of the individual clearance inspection, she would have been able to see that block sections 88 and 86 were illuminated red, and therefore occupied, in the magnified view "L_HLFG". The double arrangement of the route name, overwritten with "Leiferde crossover", on both displayed route sections on monitors 8 and 9, could also have facilitated an "incorrect perception" by the signaller in the specific operating situation.

In relation to the contributing factor "No classification of command 10 and 10.1 as travel with special instruction within guideline 408" [F4]:

The transmission of command no. 10 to the DGS 42593 driver without observing BM 2018-037/B-BW (A02) in the present situation of the continuous ATC system transmission failure was, in principle, permitted according to internal regulations, but it was linked to mandatory test criteria to be implemented in advance relating to the performance of the individual clearance inspection as per guideline 408. This procedure meant that the signaller permitted train DGS 42593 to continue onward at 40 km/h for a distance of 2,000 m. Application of BM 2018-037/B-BW (A02) would have made driving on sight necessary and increased the chances that the DGS 42593 driver would have been able to see the rear of train DGS 90977 in good time even though it was dark.

In relation to the contributing factor "Driver of DGS 42593 continues his journey, exceeding the v_{max}" [F5]:

The driver exceeding the permitted v_{max} of 40 km/h by 10 km/h contributed to increasing the extent of the damage. A speed of 40 km/h in line with the regulations would possibly have influenced the extent of the damage during the train collision. More precise investigations relating to this were not required due to the focus of the investigation set by the Federal Authority for Railway Accident Investigation.

In relation to the signaller's conduct in the event of danger [N6]:

The delayed initiation of further steps in the emergency management as per guideline 42380 by the Fallersleben West signaller contributed to external rescue measures. After receiving the information about a train collision from the DGS 90977 driver, the signaller neither transmitted an immediate emergency stop order, nor did she initiate further emergency

management steps as per guideline 42380. Instead she repeatedly attempted, 14 times in total, to establish contact with the DGS 42593 driver, to no avail. The Fallersleben Central signaller only transmitted the emergency stop order for the route, and the further steps for external rescue measures were only initiated by forwarding the report to the DB Netz AG emergency control centre in Hanover at 3:30:07 am, approximately four minutes after the event. The indecisive actions of the signaller after the train collision meant that there was a delay in initiating the rescue measures, and this was only done with the support of the Fallersleben Central signaller.

In relation to the DGS 90977 driver's conduct in the event of danger [N7]:

If an emergency stop order is not transmitted immediately after an event, this can result in subsequent events. Guideline 408.2581 stipulates that in principle people are themselves responsible for acting determinedly and prudently in doing everything to prevent or reduce danger.

It is true that after the event the driver determinedly pushed for the initiation of the necessary rescue measures and was personally intent on providing first aid to the driver of the rear train. However, if there had been immediate and correct actions in relation to transmitting the emergency stop order, it is possible that the signaller would also have become appropriately aware of the situation earlier.

His insistence in relation to the signaller, however, ultimately resulted in further steps first being initiated in the infrastructure manager's emergency management. As the local circumstances meant that it was not even possible for him to give first aid to the DGS 42593 driver after the event, he dialled the police emergency number "110" to inform them about the event and initiate rescue measures himself in this way.

5.2 Measures taken since the event

The signaller responsible at the time of the event has no longer been used as a signaller after the event.

DB Netz AG has also stated that the documentation of the signallers at the Fallersleben signal box over a period going back around two months was intensively examined after the event in relation to continuous ATC system transmission errors by cross-checking the operational documents at the signal box. This process also identified some irregularities relating to

signallers not acting fully in line with the rules. It is not known whether DB Netz AG used the results of these operational inspections as an opportunity to also include subjects specifically relating to continuous ATC systems in the operational inspections in future.

After the event, on 18/11/2022 DB Netz AG, North Region, issued a service order requiring compliance with the relevant regulations of guideline 408 in the event of continuous ATC system transmission failures. In addition, all signallers from Fallersleben electronic signal box were given individual refresher training about continuous ATC system transmission failure.

It is not known whether the infrastructure manager has now decided on comparable improvements to processes for assessing continuous ATC system transmission failures in the block section and increased monitoring of the signal box personnel beyond the North Region.

Following inspection of written instructions of the infrastructure manager as per Section 47(4) EBO [German Railway Construction and Operation Regulation] in the form of rules for train journeys with special order as per guideline 408.0455 Section 1(1), the EBA [German Federal Railway Authority] issued an instruction to avert danger as per Section 5a(2) sentence 1 AEG [German General Railway Act] via decision ref. 58411-333an/008-1438#007 dated 13/09/2023.

With this decision, the EBA mandated that the table of the DB Netz AG regulation in the guideline module 408.0455 section 1 paragraph 1 would be supplemented to include “command 10” for display-controlled trains in continuous ATC systems. It was also mandated that the signallers had to be instructed about this addition with reference to BM 2018-037/B-BW (A02) within three months of the announcement of the decision.

On 12/10/2023, DB Netz AG confirmed the implementation of this order and the adjustment of the table in guideline 408.0455 to include a line reading “command 10” for continuous ATC system transmission failures in the block section. BM 2018-037/B-BW (A02) must remain in the respective order books in the signal boxes of DB Netz AG until the adjustment of guideline 408 when the timetable changes for 2024/25, and it will then be transferred into guideline 408.

The Federal Authority for Railway Accident Investigation assesses the altered principle relating to BM 2018-037/B-BW (A02) also applying for command 10 for continuous ATC system block sections as feasible. Following transmission failure and coordination via command 10, a signal-controlled onward journey of a train that was previously display-controlled must be

technologically equated to a train journey with special order. As a result of this, in operationally similar scenarios precautionary measures are applied in an equivalent manner to reduce the possible extent of damage.

EVU LOCON Logistik & Consulting AG informed the Federal Authority for Railway Accident Investigation that the issue of the delayed transmission of the emergency call by the DGS 90977 driver was identified during initial investigations at the event location. The railway undertaking took this as an opportunity to include the subject “Conduct in the event of danger” as a special subject in the annual further training that was already scheduled starting from December 2022. In this case, the focus was on the initial assessment of the event of the train collision between Meinersen station and Leiferde (b Gifhorn) halt in the case-related presentation of the correct way to act in the event of danger.

5.3 Additional observations

During the investigation of the operational processes of the DGS 42593, it was identified that the driver increased the speed of his train, deviating from the timetable, by 10 km/h by entering the value 100 as maximum permitted speed in the train data. This setting meant that the permitted maximum speed of the train was overwritten with a speed of 100 km/h in the display-controlled areas of the journey. Even after continuing the train journey with the receipt of the command after the continuous ATC system transmission failure, the driver then again exceeded the permitted speed of 40 km/h by 10 km/h.

Incorrect entries of this kind by drivers mean that trains can travel at a speed that differs from/is higher than the timetable without detection. The Federal Authority for Railway Accident Investigation issued a safety recommendation numbered 05/2022 in relation to this in connection with the accident investigation for the train derailment on 30/08/2020 in Niederlahnstein.

It must also be noted that for telecommunications, signallers have telephone sets that require them to pick up the handset and hold it in their hand in order to hold a conversation. The signallers do not have hands-free equipment or headsets. This may result in an increased risk of distraction from operational activities in an electronic signal box. In the same way as using a phone without hands-free equipment is prohibited when driving vehicles on public roads, checks should be carried out to see whether signaller workstations should be equipped with

headsets in corresponding application of Section 23(1) StVO [German Road Traffic Regulation].

6 Safety recommendations

The following safety recommendations are made in accordance with Section 6 of the EUV and Article 26(2) of Directive (EU) 2016/798:

No.	Addressee and safety recommendation	Relates to company
04/2025	Safety authority: In order to reinforce the risk-oriented approach in all phases of competence management, it is recommended that the procedures for maintaining and updating safety-related knowledge and skills should be inspected in a workplace-specific manner and improved if necessary. This must include the activities of employees with safety-related roles and managerial tasks at all relevant levels (Regulation (EU) 2018/762, Annex II, points 4.2.1 and 6.1.1 a)).	DB Netz AG (renamed as DB InfraGO AG)
05/2025	Safety authority: It is recommended that obligatory statutory communication channels and reporting paths in the management systems of the infrastructure manager, railway undertaking and ECM should be developed/improved with the aim of all parties involved jointly reducing the frequency of continuous ATC system transmission failures. (Relating to railway undertaking: Regulation (EU) 2018/762, Annex I, point 4.4.1; infrastructure manager: Regulation (EU) 2018/762, Annex II, point 4.4.1; ECM: Regulation (EU) 2019/779, Annex II, point 7.1)	Infrastructure manager, railway undertaking, ECM