

Impact Assessment:

Re-issue of ORR guidance on Railway Safety Regulations 1999
(Reg 5 – fitting of central door locking to hinged door carriages)

Date: 26 July 2021

Stage: Final

Section 1: The issue (and rationale for action)

The issue for consultation of revised draft guidance on The Railway Safety Regulations 1999 (RSR99) Reg 5 prompted challenge from certain parts of the charter industry on the basis that such fitment was not ‘reasonably practicable’ and that ORR must therefore continue to issue exemptions.¹

While the original redrafted guidance was developed on the basis of a general understanding of the likely costs per carriage, this impact assessment seeks to present more systematically gathered cost information.

Background

The Railway Safety Regulations 1999 Reg 5 imposes an absolute duty in law to fit central door locking (CDL) to railway carriages fitted with hinged doors if they are to be used in service on the mainline railway.

Such carriages are used by mainline railway charter train operators as an integral part of providing a historic train-travel experience. At the time of coming into effect of the regulation it was neither logistically possible nor in some cases technically possible, to fit CDL to such carriages.

Accordingly, Her Majesty’s Railway Inspectorate (HMRI, which was then in the Health and Safety Executive - HSE) took advantage of the exemption provisions within the regulations and issued exemptions to charter operators on an individual carriage basis to allow operations to continue and on the proviso that a secondary locking mechanism was fitted and secured in place during travel. This was typically achieved by the addition of a bolt fitted at a high level and secured in place by a ‘steward’ allocated to the carriage.

Underpinning the issue of exemption was an expectation by HMRI that over time Charter fleet operators would progressively fit CDL as carriages came in for maintenance, significant repair or overhaul and that in due course use of exemption could be dispensed with. One charter operator – Hastings Diesels – undertook such fitment circa 2006. Similarly London Underground also had CDL fitted to its “4TC” set of four carriages in the early 2000’s.

In 2018 (19 years after the introduction of RSR) HMRI - now the Railway Safety Directorate of ORR, concluded that a sufficient period of time had elapsed for such fitment to be achieved and therefore undertook a redrafting of its guidance on RSR and CDL. In its consultation it proposed

¹ See our December 2020 consultation on revision of ORR guidance on application of the RSR 99 to Mark 1 type and hinged door rolling stock available on our website at – <https://www.orr.gov.uk/search-consultations/consultation-revision-orr-guidance-application-railway-safety-regulations-1999>

cessation of the routine issue of exemptions from 2023 as existing ones expired. In knowledge and anticipation of these changes two further charter train operators have commenced fitment of CDL to their carriage fleets.

Section 2: The objectives

The original redrafting of guidance was aimed at ensuring that the requirements of the Railway Safety Regulations 1999 (Reg 5) were implemented as written. RSR99 Reg 5 is an absolute duty. It is unqualified by either 'reasonably practicable' or 'practicable'. However at the time of introduction of the regulations (1999) HMRI (then in HSE) made use of the 'exemption' provision within the regulations to enable heritage stock to continue operation on the mainline on the assumption that operators would progressively fit CDL. A period of 19 years having elapsed, in 2018 ORR gave notice of its intention to cease routinely issuing exemptions and its intention to confine such exemptions to the most rigorously made and assessed cases. Challenge has been made to ORR is that in issuing exemptions for so many years ORR has made 'reasonable practicability' a factor that must be considered.

The objective of the redrafted guidance is to bring about compliance with RSR 99 and its absolute requirement to fit CDL to hinged door stock and so (ultimately) to reduce the risk of passengers opening doors in service and suffering fatal falls from trains.

The objective of this impact assessment has been to gather cost data from those charter operators who have either fitted CDL or a fitting CDL. These are, Hastings Diesels (CDL is fitted), Locomotive services and Vintage Trains (both currently fitting CDL). Additional information was sought from WABTEC (availability of recovered components) and Arlington Fleet Services (design-from-scratch estimations). These figures were then weighed against the Value of **Preventing a Fatality** (VPF) as published in 2019 by DfT and used by RSSB (£2,017,000) with a view to:

- a) affirming the validity of the objective to bring about compliance with RSR 99 Reg 5 and
- b) confirming that regardless of the absolute duty imposed, fitment of CDL is in fact a 'reasonably practicable' thing to do.

The costing exercise was :

Specific Costings for fitting CDL to mainline charter heritage stock (3 Co's approached—see above)

Measurable ... Cost per door, per coach and per operating set

Achievable Costs were being sought from operators carrying out such fitment

Relevant Cost were only being sought in relation to coaching stock being so fitted

Time-bound... Replies were sought by 19 March 2021 from the 3 primary organisations approached. All 3 responded by that date although only 2 provided costs data.

Section 3: Option generation and appraisal

As indicated above RSR99 Reg 5 is an absolute duty nonetheless the following three options were considered by ORR:

Option 1: Do nothing and continue to issue exemptions.

This is not considered tenable as the law is absolute and while provision needed to be made at

the point of introduction of RSR99 a period of 21 years has elapsed without the required progress in the industry

. Two out of 3 of the main players in the heritage charter sector are already committed to fitting CDL, it would create disparity in the sector with some dutyholders legally compliant and at least one not and relying on exemptions when it is demonstrable such exemptions are not needed. This creates risk for ORR in its regulatory capacity particularly in the case of an accident / incident involving hinged doors in exempted coaches. In the light of the safety concerns that led to the introduction of RSR99 and the sufficient time for relevant stock to be fitted with CDL, we have the view that the current practice of routine issuing of exemptions is no longer a viable course of action.

Option 2: Issue exemption but against much stricter criteria

This option still exists and is explicitly retained in the revised guidance which sets out the stricter criteria (see section 4 of the revised [guidance](#)). The revised criteria set out a much more structured path to be followed when seeking an exemption for RSR99 Reg 5 CDL requirement in line with the requirements of the Management of Health and Safety at Work Regs 1999 (MHSWRegs). In particular they require both the application of the 'Hierarchy of Controls' specified within those regulations and the submission of quantified risk assessments to demonstrate at least equivalence with the level of safety achievable through the fitting of CDL. The advice of Legal Counsel has been sought and the following observation has been made with regard to the approach adopted *"There is no question of predetermination and the Guidance makes it clear that, in accordance with Regulation 6, the discretion will continue to be exercised."*

ORR will give full and rigorous consideration to any application for exemption received. However it recognises that exemption criteria more strictly aligned to the requirements of MHSW Regs may alter the balance for dutyholders between cost of fitting CDL and costs of obtaining exemption (including the possibility of such exemption being refused and stock being unable to run).

Option 3: Require compliance with the law (RSR99 Reg 5)

This is the approach put forward in the revised guidance and adopted by 2 of the 3 main players in the heritage charter sector. While this approach does not dispense with the issues of exemptions its sets more rigorous circumstances underpinning their issue, given that fitting of CDL is now considered viable option.

Promoting legal compliance is an integral part of ORR's H&S regulatory function. A period of 21 years has been allowed to pass for the industry to become compliant. In adopting the "fit CDL as required by law" position prior to issuing the redrafted guidance for consultation, ORR was aware that 2 of the 3 main players were already working on fitting CDL to the coach stock they operate and that cost indications were that regardless of the 'absolute' nature of RSR99 (Reg 5), cost in terms of time, money and trouble to undertake such fitment were very likely to be well within the bounds of 'reasonable practicability' .

This is now the course of action followed by ORR and the aim of this Impact assessment is to demonstrate this position more robustly to support further the validity of the revised guidance, i.e. fit CDL as required by the absolute duty of RSR99 (Reg 5).

The Charter Train sector is a small but distinct grouping of operators (6 in total; including occasional operators) working on the UK mainline and providing an historic train-travel experience. With 3 of these having either fitted CDL or being in the process of fitting CDL in compliance with

RSR 99 reg 5, it would not be proportionate to those operators to allow their direct competitors to continue under exemptions without considering the issue of such exemptions on the basis of a comparable control of risks within the UK H&S legal framework. Consequently while RSR99 Reg 5 is absolute, ORR has nonetheless sought costings from those undertaking CDL fitment to reassure itself that adopting such an approach is 'Reasonably Practicable'. This is outlined in the next two sections.

Section 4: Evaluation

To evaluate the financial impact on the Mainline Charter operators of ORR's cessation of the routine issue of exemptions and the move to require full compliance with RSR 99 Reg 5, ORR approached two operators, currently in the process of fitting CDL (in spring 2021) and one of that fitted CDL circa 2006 .

The approach sought to obtain from respondents is set out in the contact letter as follows :-

“Accordingly, we would be grateful if you could provide ORR with a simple breakdown of the cost of fitting CDL to those hinged door coaches you intend to use for mainline charter purposes.

We are not looking for a nut and bolt breakdown of such costs.

A simple 'cost per door' in terms of component cost plus fitment costs, or 'cost per carriage' similarly broken down (together with the No of doors per carriage), will suffice.

It would also be useful to understand the maximum number of carriages that are normally operated as train set to gain an understanding of the overall cost of equipping a commercially operated set of carriages with CDL equipment.

Finally, it would assist ORR if you could indicate who the supplier is for the equipment that you have used (or intend to use) for your CDL fitment.”

The responses received will be consolidated to give an upper estimate and a lower estimate and an average cost of CDL fitment

- per door,*
- per carriage and*
- per operational carriage set (based on a 9 Carriage set)*

This will then be considered against the RSSB standard of the 'Value of preventing a fatality' (VPF) ; Currently set at the 2019 figure of £2,017,000

Detail of the VPF can be found at the following link, <https://www.rssb.co.uk/en/safety-and-health/guidance-and-good-practice/taking-safe-decisions/taking-safe-decisions-safety-related-cba>

This states:

Value of preventing a fatality

RSSB recommends that rail operators use the following Value of Preventing a Fatality (VPF) for the valuation of safety benefits and disbenefits in decision taking processes:

1.1 VPF2020 = £2,017,000

In normal times, an estimate of the Value of Preventing a Fatality (VPF), was made yearly by uprating the DfT's Value of Preventing a Fatality (VPF) using economic indicators.

In September 2019 the Department for Transport (DfT) published a VPF of £1,958,303, in 2018 prices. For RSSB members who wish to use a more up-to-date forecast this figure was up-rated to June 2019 prices using the latest available data from the Office for National Statistics and following the DfT up-rating method. As such, the VPF figure for 2019 was estimated by RSSB to be £2,017,000.

Section 5: Evaluation Conclusion

Based upon the cost figures provided by respondents:

Upper cost limits for fitment of CLD

- per carriage and (includes a %5 + allowance)	£26,250
- per operational carriage set (based on a 9 Carriage set)	£236,250
- per operational carriage set (based on a 13 Carriage set)	£341,250

Lower cost limits for fitment of CDL

- per carriage and	£10,175
- per operational carriage set (based on a 9 Carriage set)	£91575
- per operational carriage set (based on a 13 Carriage set)	£132,278

Average cost for fitment of CDL

- per carriage and	£18,212
- per operational carriage set (based on a 9 Carriage set)	£163,912
- per operational carriage set (based on a 13 Carriage set)	£236,756

Additional information was also obtained from a potential supplier of recovered CDL components (WABTEC) which indicated that there was limited availability of such components and the such recovery was *not* taking place proactively. In short, such components are unlikely to be available in the future or if they are, availability will be severely limited.

However RSR 99 does *not* specify the mechanism of secondary central door locking to be adopted. Research indicates that solenoid operated electro-mechanical (EM) ‘shot-bolt’ mechanisms potentially suitable for the task are available (circa £400 per unit; although more detailed research may produce equally effective units at lower cost). A further cost estimation has therefore been developed taking the upper cost limits figure and including an additional figure for 6x EM shot-bolt mechanisms per train carriage. This is set out below.

Upper cost limits for fitment of CLD based on additional electro mechanical components

Advice was sought from ORR rolling stock engineers on the acceptability of using and fitting electro-mechanical CDL. They have confirmed a ‘shot bolt’ fitted to operate vertically to provide a centrally operated secondary locking mechanism is an acceptable solution for CDL purposes on heritage charter trains.

- per carriage and (includes a %5 + allowance)	£29,050
- per operational carriage set (based on a 9 Carriage set)	£236,250
- per operational carriage set (based on a 13 Carriage set)	£377,520

Summary of Cost Estimates

For fitting of recovered conventional pneumatic CDL equipment:

Based on **Upper Cost Limit** provided by dutyholders the **maximum cost per carriage for CDL = £26,250.**

Based on a 9 carriage formation for a train the **maximum cost per formation = £236,250**

Based on a 13 carriage formation **maximum cost per formation = £341,250**

For fitting of electro-mechanical CDL equipment:

Based on **Upper Cost Limit** estimated **maximum cost per carriage for CDL = £29,050**

Based on a 9 carriage formation for a train the **maximum cost per formation = £261,360**

Based on a 13 carriage formation **maximum cost per formation = £377,520**

Highest costs dutyholder figures against Value of Preventing a Fatality

The RSSB document “[Taking Safe Decisions - Cost-Benefit Analysis](#)” is the nationally recognised and long accepted threshold for determining whether an investment should be made to ensure

safety – the Value of Preventing a Fatality (VPF).

The current **VPF is at 2019 valuations, £2,017,000.**

Accordingly, based on the highest actual costs provided by a dutyholder currently carrying out CDL fitment (maximum cost per carriage for CDL = £26,250) a charter operator would need to install CDL on up to 77 Carriages (6 x 13 carriage formations [78 carriages]) before the question of exceeding the 'value of preventing a fatality' becomes a meaningful consideration .

Highest costs estimated electro mechanical fitment figures against Value of Preventing a Fatality

The RSSB document "[Taking Safe Decisions - Cost-Benefit Analysis](#)" is the nationally recognised and long accepted threshold for determining whether an investment should be made to ensure safety – the Value of Preventing a Fatality (VPF).

The current **VPF is, at 2019 valuations, £2,017,000.**

Accordingly, highest cost estimates if carriages were to be fitted with electro-mechanical CDL systems (maximum cost per carriage for CDL = £29,050) would require 69 Carriages (more than 5 x 13 carriage formations [65 carriages]) to be fitted before the question of exceeding the 'value of preventing a fatality' becomes a consideration.

Maximum Number of carriage formations operated at any one time by a single operator

Advice has been sought from Network Rail on the maximum number of formations run (or potentially required to run) by any of the registered Charter Heritage operators on the same day. No Charter operator currently holding RSR99 exemptions is known by NR to have had more than 4 x 12 carriage formations in operation at the same time.

At a maximum cost per 12 car formation of £348,440 per formation (EM CDL estimated costs), fitting CDL to the maximum number of formations a single operator likely to put into use on the same day (4) would cost £1,393,920; well below the VPF.

Moreover such an operator could fit a further 21 carriages (i.e. a full further 12 carriage formation plus 9 carriages available 'in reserve') with CDL capability (e.g for back-up replacement carriage purposes) and still fall below the 2019 VPF based on highest cost limit estimates (for EM CDL) .

Worst case cost limits

The highest indicative costings came from Arlington Fleet Services, the business that originally fitted CDL to the LUL 4TC carriages. They indicated a broad cost of circa £30,000 per carriage using recovered components but indicated that a cost of £50,000 might be more relevant if a 'design-from-scratch' approach was required. Even taking this £50,000 figure the cost of equipping a 13 carriage set is £650,000, somewhat under 1/3rd of the VPF.

Maintenance costs

As with any system deployed on rolling stock, once installed there will be on-going maintenance costs and repair costs associated with whatever system is fitted. No detailed costing of on-going maintenance has been sought.

The 'no means to achieve' argument

For some operators , particularly smaller operators who operate on minimal profit margins and who had no income during the Covid 19 pandemic there are likely to be issues raised on their ability to pay for the fitment of a form of CDL in the short to medium term.

The guidance of the Health and Safety Executive [which ORR follows] is that '*the ability of the duty*

*holder to afford a control measure is not a legitimate factor in the assessment of costs. This ensures that duty holders are presented with a level playing field'**

This position ensures that staff and public can expect comparable levels of safety regardless of the operator of a train service. ORR's position on exemptions and timescales for implementation provides a pathway to compliance for these smaller operators. This is set out in the revised guidance and essentially requires operators who cannot achieve compliance for CDL to have a plan and a deadline for achieving compliance.

*(*The HSE text is from R2P2, appendix 3, section 19, right at the end)*

Summary

ORR has confirmed in its revised guidance on RSR99 Reg 5 (hinged door stock) to cease the routine issuing of exemptions. The option for issuing exemptions remains but will only be considered under the most stringent of conditions (details of which form part of the guidance) and in line with the requirements of the MHSW99.

Real-world costings provide by Charter Heritage operators (2 out of 3 of the main operators) already undertaking CDL fitment indicates that although the requirement under RSR99 Reg 5 is absolute, the cost of fitting CDL to hinged door rolling stock and carriage formations is nonetheless 'Reasonably practicable' when considered against the Value of Preventing a Fatality. Moreover fitting an electro-mechanical CDL system while estimated to represent marginally higher costs would still allow the largest scale operator to fit all the carriage sets used and still have a fully CDL equipped carriage set and 9 'spare' carriages in hand and still be under the Value of Preventing a Fatality.
