



## Certificate of Derogation from a Railway Group Standard

(in accordance with part 6 of the Railway Group Standards Code)

### 1. Type of deviation

Deviation Number: **12/088/DGN**

Derogation

### 2. Details of applicant:

Major Projects Engineer, Freightliner Group, 3rd Floor, The Podium, 1 Eversholt Street, London NW1 2FL

### 3. Your reference number:

E04.225.D03

### 4. Status of applicant:

Railway Undertaking, RSSB Member

### 5. Title of certificate:

Ecofret FWA(A) (twin outer) wagons with SCT bogies and a 9'6" high x 2500 mm wide container – side wind loading for application to W10 gauge

### 6a. Details of Railway Group Standard (RGS):

RGS Number:	Issue No:	Issue Date:	Title:
GE/RT8073	Two	October 2009	Requirements for the Application of Standard Vehicle Gauges

### 6b. RGS clause(s):

1.2.7.6 and 2.1.2.5

### 6c. RGS clause requirements:

"1.2.7.6 For some gauges, coordinates incorporating dynamic movements together with the effects of a side wind load are provided, which define the maximum envelope that the vehicle is permitted to occupy when operating at up to its maximum speed and cant deficiency, and including the effect of a 35 m/s side wind loading."

"2.1.2.5 For gauges having an upper dynamic gauge including the effects of a side wind load, it is permissible to declare the vehicle to be compliant with the upper dynamic gauge, if it can be demonstrated that, at all conditions of speed, cant deficiency and specified wind loading, its dynamic envelope remains within that of a vehicle with an established suspension conforming to the required standard vehicle gauge."

### 7. Scope of deviation:

This derogation covers the Ecofret wagons which are being introduced in service in Autumn 2012. These wagons are configured as a 'Twin set' consisting of two vehicles of car kind code FWA(A) outer, design code IFE966. The wagons are fitted with SCT bogies and are required to carry 9' 6" high containers in the W10 gauge.

**8. Impacts of complying with the current RGS requirement:**

The requirements for the W10 gauge from GE/RT8073 appendix F show a second dynamic gauge line that includes the effect of a wind loading. Although the W10 and W12 gauges are shown with an additional gauge for dynamic movements with wind, there is no information or other guidance given in either GE/RT8073 or GE/GN8573 on how to calculate the effect of wind on a vehicle, such that it can be compared against the relevant gauge line. Various sources of information were sought on this issue, but no one contacted at Network Rail, RSSB or other industry experts could shed light on the method to be used for this assessment. Therefore a reasonable approach was derived as follows by calculating the moment on the vehicle due to the wind loading using the methodology from GM/RT2142 issue 3 Resistance of Railway Vehicles to Roll-Over in Gales.

Calculations have been carried out (see report Ecofret Gauging with Wind Calculation – calculation 170902C02A) based on the approach set out in section 9 of this certificate which show that the Ecofret FWA(A) (twin outer) wagons with SCT bogies are within the gauge lines for W10 gauge set out in GE/RT8073 Appendix F.

**9. Proposed alternative actions:**

GE/RT8073 sets out a wind loading for W10 gauge as 35.0m/s which is equivalent to 78.29 mph. By inspection, this is a severe wind loading. The windloading for the consideration of overturning is set out in GM/RT2142 as 30.8m/s which is equivalent to 68.9 mph. It is noted that the wind speed in GE/RT8073 could be enough to roll a vehicle conformant to GM/RT2142.

However, although not stated in GE/RT8073, Balfour Beatty Report [BBRT] Freight Gauge Investigation BBRT-9672-010-001-03 implies that the 35m/s wind for the W10 and W12 gauges is intended to be gust speed. This is shown in [BBRT] Appendix A, which is a DGauge Report [DG]. It is stated in this report that the author of this report was involved in the writing of GE/RT8073.

In [DG] section 4.2 (page 24 of 71), the gauging analysis for W10 with wind was carried out "with a 22m/s mean (side) wind speed, equivalent to a 35m/s gust." The same words are used for W11. It was therefore assumed that the 35m/s referred to in GE/RT8073 is a gust speed, and that the equivalent constant wind speed is 22m/s. The wind loading used in GM/RT2142 is a constant wind speed, so it is assumed that the 22m/s wind speed is appropriate to use with the calculation method from GM/RT2142.

The report, Ecofret Gauging with Wind Calculation 170902C02A in the appendix, demonstrated the Ecofret Outer wagon is within W10 gauge based on two main assumptions.

- The 35m/s is meant as a gust of wind and is equivalent to a 22m/s steady state side wind.
- The wind load is applied halfway down the container.

**10. Impacts of the alternative actions:**

It is suggested that the intention of GE/RT8073 is to use a mean side wind speed with an appropriate gust speed.

**11. What other options have been considered?**

A comparative gauging approach was considered but having developed a methodology for considering side wind loads, this approach did not need to be pursued.

**12. Consultation with affected parties**

Both Freightliner and VTG have consulted Network Rail Compatibility Group in relation to this matter, and there have been lengthy discussions of the methodology of carrying out gauging analysis. We have stated to Network Rail that we intend to take the approach outlined in this document and they have no objections to this course of action but will only grant us compatibility with the support of the Standards Committee via a derogation.

**13. Additional actions/observations:**

Upon receipt, the applicant is required to identify affected, interfacing parties and copy this certificate, together with supporting information, to those parties.

**References:**

- Ecofret gauging with Wind Calculation (170902C02A), Lloyds Register Rail
- GM/RT2142 issue 3 Resistance of Railway Vehicles to Roll-Over in Gales
- Freight Gauge Investigation - BBRT-9672-010-001-03 Balfour Beatty Rail Technologies Limited
- DGauge report DG-TR-0031 Issue 3 Proposed changes to GE/RT8073 (included as Appendix A in BBRT-9672-010-001-03).

**14. Method of elimination:**

N/A

**15. Start and end date:**

N/A

**16. Signature of applicant:**

Major Project Engineer

**Date of application:**

01/06/2012

**17. Status in respect of National Technical Rules:**

GE/RT8073 Issue 2 is currently on the list of National Technical Rules under the:

- Infrastructure Conventional Rail TSI
- Locomotives and Passenger Carriages Conventional Rail TSI.

**18. Status in respect of National Safety Rules:**

GE/RT8073 Issue 2 is currently not on the list of National Safety Rules.

**19. Lead Standards Committee details:****Name of Committee:**

Infrastructure

**Date of meeting**

12/09/2012

**Minute reference:**

12/INS/09/171

**Authorised by:**

Signed by Cliff Cork on 27/09/2012

**Date of Authorisation:**

27/09/2012

Cliff Cork

Head of Delivery, Infrastructure and Rolling Stock