



## Deviation from a Railway Group Standard

(In accordance with the Railway Group Standards Code, Issue Four, part 7)

**Deviation Number: 13/085/DEV**

### 1. Start and End Date:

N/A

### 2. Details of applicant:

, International Locomotive Compliance, GE Transportation, 2901 East Lake Rd, Erie, PA 16531 USA - Bldg. 14 - 350

### 3. Your reference number:

N/A

### 4. Status of applicant:

Contracting entity - The party who must current comply, or may reasonably be expected to have to comply in future, with the RGS.

### 5. Title of certificate:

Deviation for windscreen wiper swept area on Class 70 locomotive.

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

<b>RGS Number:</b>	<b>Issue No:</b>	<b>Issue Date:</b>	<b>Title:</b>
GM/RT2161	One	August 1995	Requirements for Driving Cabs of Railway Vehicles.

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

6.1.1 & 6.2.6

### 6c. RGS clause requirements:

"6.1.1 Seated Drivers

The front windscreen of a cab shall provide, as a minimum, the following clear unobstructed lines of sight (views) for the driver seated at the Driving Position, taking into account the variations and tolerances described in Section 4.2 and the requirements of Section 6.2.6.

For each viewing case below, a person's eyes shall be considered to be at a point contained within an imaginary reference cube. The reference cube shall have 400 mm long sides and have its centre situated 800 mm above the centre of the surface of the driver's seat cushion, with the seat adjusted vertically and horizontally to its mid-position. The imaginary cube shall be orientated with sides parallel to the longitudinal axis of the vehicle.

Case (a): A view of the track (at rail height) at 5 m beyond the vehicle buffers (or vehicle end) for vehicles subject to frequent coupling and uncoupling activities. For other vehicles, the viewing distance shall be 10 m beyond the vehicle buffers (or vehicle end).

...

Case (c): For cabs without a central gangway, a view of signals positioned 5 m beyond the vehicle buffers (or vehicle end) at all heights between 1.5 m and 6.0 m above rail level and at all lateral positions between 2.5 m to the right of track centreline through to 2.5 m to the left of track centreline. This view together with the view in Case (a) shall be visible from the same point within the reference cube.

...”

“6.2.6 Appropriate means shall be provided to maintain the above specified sighting, visibility and optical requirements through the windscreen under all external and internal ambient conditions, including: rain, snow, ice, solar glare, dust and debris, high humidity, etc. Such means may include: windscreen heaters, washers, wipers and rain-flow deflectors, de-misters, de-icers, sun visors, blinds, tinted glass, etc.

It shall be ensured that such visibility aids do not obscure the Primary Vision Area or adversely affect visibility and the optical properties of the windscreen, particularly with regard to the sighting of signals, the imaging of signals, and the colour of signal lights.”

#### **7. Scope of deviation:**

All Class 70 locomotives.

#### **8. Duration of the deviation:**

Permanent – no time or date limits.

#### **9. Method of elimination:**

N/A

#### **10. Impacts of complying with the current RGS requirement:**

GE Transportation has recently been working to increase the reliability of the windscreen wipers on the Class 70 locomotives. Part of the existing problem is that tolerance build ups can lead to the wider blades striking the edge of the windscreen. During the development of the modification, it was identified that the sightline requirements for cases A and C (as described above) do not pass through the area of the windscreen that is wiped by the windscreen wipers when viewed from the same point in the reference cube. (The sightlines do pass through the windscreen itself, and they do pass through the wiper’s swept area if viewed from different points in the reference cube). The attached paper provides additional explanation.

To date, in the three years that Class 70s have been in service, there have been no recorded complaints or problems for drivers in respect to the RGS sightlines not passing through the swept area (problems have related to the faults with the wipers themselves).

The changes proposed by GE Transportation to increase the wiper arm and wiper blade length, whilst reducing the angular sweep of the arms, will provide improvements in reliability, whilst having a small degree of non-compliance.

GE Transportation’s modification design work to date has concluded that it is not practically possible to make the wiper system reliably sweep the area needed for the case A and C sightlines to pass through the swept area when viewed from a single point in the reference cube, without significant re-design of the cab front end / windscreen.

In making this application, it should be noted that structural members and collapsible elements with anti-climbers were incorporated into the cab structural design in order to meet the crashworthiness standard EN 15227, which is now specified from the Loc+Pas TSI and latest issue of GM/RT2100, the first time such requirements have been met on a UK locomotive. As such, there is no practical scope to lower the lower edge of the windscreen – the structural crashworthiness requirements drove the position of the windscreen lower edge, whilst both the structural needs and gauging limitations dictated the upper edge and sides. It also limits the ability to radically change the wiper positioning.

It is considered by the applicant that the risk caused by this small extent of non-compliance is considered to be small, and it is not reasonably practical to redesign the cab and wiper system to be completely compliant.

#### **11. Proposed alternative provisions:**

GE Transportation is seeking a deviation against GM/RT2161 Issue 1 in relation to clause 6.2.6:

The modified design will be installed on all future locomotives, which offers the improved level of reliability and only minor non-compliance, without undergoing significant engineering change.

**12. Impacts of the alternative provisions:**

The design modification proposed by GE Transportation will lead to an increase in the reliability of the windscreen wipers while providing the best swept areas of the wipers, without undertaking major redesign of the cab structure / windscreen. It provides a reliability improvement over the existing design. The new design is only marginally non-compliant, and is considered to present no greater risk than on other vehicles where similar derogations have been granted in the past. Please refer to the attached document for further details.

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

Re-design has been considered, and the proposed modification has only a small degree of non-compliance. However, re-design / modification to be completely compliant has been discounted as impractical, as described earlier.

**14. Consultation with affected parties**

No other direct consultation undertaken.

**15. 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.

Attachments:

- Additional paper to support the Derogation application to GM/RT2161 (clause 6.1.2) for the class 70 Locomotive – Windscreen wipers / sightlines. This report includes:
  - Figures 1 & 2 showing that
    - Case C is met (orange and purple lines)
    - Case A is also met for 10 m in front of buffers (red lines)
    - But Case A is not met for 5 m in front of buffers (yellow lines)
  - Figures 3 & 4 showing that
    - Case C is met
    - Plus rail head can be seen 6.9 m in front of buffer (yellow lines).

**16. Signature of applicant:**

, International Locomotive Compliance

**Date of application:**

06/06/2013

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

Rolling Stock

**Date of meeting**

28/06/2013

**Minute reference:**

13/RST/06/170

**Authorised by:**

Signed by Cliff Cork on 18/07/2013

**Date of Authorisation:**

18/07/2013

Cliff Cork

Head of Delivery, Infrastructure and Rolling Stock