

## HAZARD CLOSEOUT SHEET



NOVEMBER 2014

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Job No: <b>MP/13/002</b>	Assignment Title: <b>Class 37 RETB Installation</b>		
ECR No: N/A	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>		Date Raised: November 2014	Hazard No: 001
<b>Description of Hazard:</b> <b>1.1 Derailment</b> <ul style="list-style-type: none"> <li>• Equipment falling from vehicles</li> <li>• Vehicle structural failure</li> </ul> <b>1.2 Gauge Infringement</b> <ul style="list-style-type: none"> <li>• Equipment partly detached</li> </ul> <b>1.6 Reduced Vehicle Safety Performance</b> <ul style="list-style-type: none"> <li>• Reduced structural crashworthiness</li> <li>• Reduced equipment security</li> </ul> <b>1.7 Safety – Hazards to crew</b> <ul style="list-style-type: none"> <li>• Impact by loose equipment</li> <li>• Structural failure of fixtures and fittings</li> <li>• Sharp edges of broken fixtures and fittings</li> </ul> <b>1.9 Off-vehicle/Infrastructure hazards</b> <ul style="list-style-type: none"> <li>• Equipment detaching from vehicles</li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
All installations have been assessed against the requirements of DG8-CALC-00366 GM/RT 2100 Issue 5 and it has been demonstrated that the design fully complies with the standard.	

## CLOSE OUT

CREATED:	DATE:	CHECKED:	DATE:
<b>J. Brookling</b>	<b>November 2014</b>	<b>M. Hoptroff</b>	<b>November 2014</b>
SIGNED:			

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ECR No: N/A	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 002	
<b>Description of Hazard:</b> <b>1.2 Gauge Infringement</b> <ul style="list-style-type: none"><li>• Increased vehicle envelope</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The antennas are fitted in front of the cab on the bonnet close to the vehicle centreline and do not present any risk of gauge infringement.	
	MP-C0-00077

## CLOSE OUT

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ECR No: N/A	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 003	
<b>Description of Hazard:</b> <b>1.2 Gauge Infringement</b> <ul style="list-style-type: none"> <li>• Dynamic effects</li> <li>• Increased/redistributed mass</li> </ul> <b>1.3 Brake Failure</b> <ul style="list-style-type: none"> <li>• Increased mass</li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>Of the two installation types, the largest mass addition is that of type 1. The mass change as a result of the type 1 modification is as follows:</p> <p>Antenna installation = 1kg            CDR installation = 11kg            Handset installation = 3kg            Junction box and speaker installation = 8kg            Cabling = 3kg            (Above masses are conservative)</p> <p>The total mass of the equipment to be installed on the Class 37 vehicles is approximately 26kg.</p> <p>The additional masses due to both type 1 and type 2 modifications can be considered to have a negligible effect on the gauging of the vehicle.</p> <p>The additional mass is considered to have a negligible effect on vehicle braking.</p>	

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Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 004	
<b>1.3 Brake Failure</b> <ul style="list-style-type: none"> <li><b>Interference with driver's sightlines</b></li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>The CDR unit is mounted close to the vehicle centreline, and is not within the driver's sightline.</p> <p>The handset is positioned below the existing GSM-R equipment and below the cab forward window. It is not within the driver's sightline.</p> <p>All other equipment is to be installed in areas that are away from the driver's sightlines.</p> <p>The whip antenna is positioned in the existing NRN antenna location and is not considered to significantly affect driver's sightlines.</p>	<p>MP-C0-00065</p> <p>MP-C0-00066</p> <p>MP-C0-00067</p> <p>MP-C0-00068</p>

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ECR No: N/A	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 005	
<b>Description of Hazard:</b> <b>1.4 Control System Failure</b> <ul style="list-style-type: none"> <li>• Effect on other systems</li> <li>• Electromagnetic interference with control systems</li> </ul> <b>1.9 Off-Vehicle/Infrastructure Hazards</b> <ul style="list-style-type: none"> <li>• Interference with signalling</li> <li>• Electromagnetic compatibility (EMC)</li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>All system equipment shall be tested against the requirements of EN50121-3-2:2006 as required for a vehicle installation. The installation design follows best principles regarding the positioning of equipment and routing of cables throughout the vehicle.</p> <p>The vehicle is a Diesel locomotive with electric transmission. There are known areas which present an EMC hazard. These are not local to the position of the RETB NG equipment.</p> <p>In the area selected there are no existing systems which give special concern regarding their own susceptibility. Equipment approved to the same standards is already operating satisfactorily in this area.</p> <p>It is noted that the units have been retro fitted with equipment since delivery which comply with EN 50155, EN 50121, and RIA 12 which have performed reliably.</p>	ICD-1051-01

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ECR No: N/A	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>		Date Raised: November 2014	Hazard No: 006
<b>Description of Hazard:</b> <b>1.5 Fire</b> <ul style="list-style-type: none"><li>• Cause fire</li><li>• Emit toxic fumes/smoke after ignition</li></ul> <b>1.6 Reduced vehicle safety performance</b> <ul style="list-style-type: none"><li>• Reduced fire performance</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The RETB NG installation meets the fire performance requirements of GM/RT 2130 Issue 4 and therefore poses minimal risk with regard to fire performance of the vehicle.	MP INV 001

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ECR No: N/A	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>		Date Raised: November 2014	Hazard No: 007
<b>Description of Hazard:</b> <b>1.6 Reduced Vehicle Safety Performance</b> <ul style="list-style-type: none"><li>• Inadequate labelling/identification</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The equipment is powered from a replacement power supply and all new circuits are only 13.8V, therefore, additional safety labels are not required.	

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ECR No: N/A	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 008	
<b>Description of Hazard:</b> <b>1.6 Reduced Vehicle Safety Performance</b> <ul style="list-style-type: none"><li>• Reduced interior crashworthiness</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
All installations have been assessed against the requirements of DG8-CALC-00366 GM/RT 2100 Issue 5 and it has been demonstrated that the design fully complies with the standard.	

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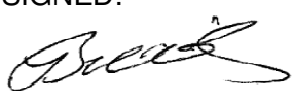

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 009	
<b>Description of Hazard:</b> <b>1.6 Reduced Vehicle Safety Performance</b> <ul style="list-style-type: none"> <li>• Misuse of equipment and systems</li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>All staff required to operate the equipment should be fully trained on the safe use of the systems being fitted to the vehicle.</p> <p>Operational procedures, including PTS and depot inductions, will reduce the risks during operation.</p>	

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ECR No: N/A	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 010	
<b>Description of Hazard:</b> <b>1.6 Reduced Vehicle Safety Performance</b> <ul style="list-style-type: none"> <li><b>Inadequate electrical bonding</b></li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>The bond resistance is tested following installation to ensure a result of less than 10mΩ is achieved.</p> <p>An earth connection between the junction box earth stud and a local vehicle earth stud in the vehicle cab is provided.</p> <p>The antennas are earthed to the steel structure of the vehicle via their fixings to provide a bond between the antenna and the vehicle.</p>	
	MP-C0-00069 MP-C0-00073 MP-C0-00077  Modification Procedure document VMP-RETB-004

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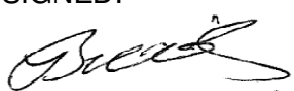

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 011	
<b>Description of Hazard:</b> <b>1.6 Reduced Vehicle Safety Performance</b> <ul style="list-style-type: none"><li>• Inadequate radio communication</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The installation design has been produced in accordance with ICD-1051-01 the system suppliers Interface Control Document.	

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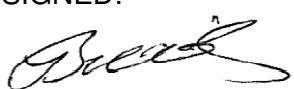

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>		Date Raised: November 2014	Hazard No: 012
Description of Hazard: <b>1.7 Safety – Hazards to Crew</b> <ul style="list-style-type: none"><li>• Sharp edges and protrusions</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The design of the cab and antenna equipment has been developed to minimise sharp corners and edges on brackets.	MP-C0-00070 MP-C0-00071 MP-C0-00072 MP-C0-00074 MP-C0-00075 MP-C0-00076

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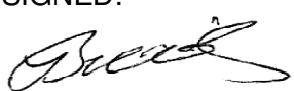

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 013	
Description of Hazard: <b>1.7 Safety – Hazards to Crew</b> <ul style="list-style-type: none"><li>• Limb/finger trapping</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The designs have been developed so that the risk of trapping is minimal. The risk of trapping is considered to be negligible.	
	MP-C0-00069 MP-C0-00073

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Job No: <b>MP/13/002</b>	Assignment Title: <b>Class 37 RETB Installation</b>		
ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 014	
<b>Description of Hazard:</b> <b>1.7 Safety – Hazards to Crew</b> <ul style="list-style-type: none"><li>• Radiation (microwave, ultraviolet etc)</li><li>• Excessive magnetic fields</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The installation design has been produced in accordance with ICD-1051-01 the system suppliers Interface Control Document.	

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Job No: <b>MP/13/002</b>	Assignment Title: <b>Class 37 RETB Installation</b>		
ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 015	
<b>Description of Hazard:</b> <b>1.7 Safety – Hazards to Crew</b> <ul style="list-style-type: none"> <li>• <b>Electrocution</b></li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>The bond resistance is tested following installation to ensure a result of less than 10mΩ is achieved.</p> <p>An earth connection between the junction box earth stud and a local vehicle earth stud in the vehicle cab is provided.</p> <p>The antennas are earthed to the steel structure of the vehicle via their fixings to provide a bond between the antenna and the vehicle.</p>	<p>MP-C0-00069 MP-C0-00073 MP-C0-00077</p> <p>Modification Procedure document VMP-RETB-004</p>

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 016	
<b>Description of Hazard:</b> <b>1.8 Occupational Health &amp; Safety of DRS and WCR, Sub-contractors' Staff, Overhaulers' or Maintainers' Staff or Operational Staff</b>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>All hazards highlighted in this section are mitigated using the following documents / qualified staff / tools:</p> <ul style="list-style-type: none"> <li>Modification Procedure</li> <li>Installation drawings</li> </ul> <p>Use qualified / competent suppliers with safety critical cards and correct health &amp; safety policies.</p>	<p>Installation Drawings: MP-C0-00067 MP-C0-00068 MP-C0-00069 MP-C0-00077</p> <p>Modification Procedure: VMP-RETB-004</p>

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>		Date Raised: November 2014	Hazard No: 017
<b>Description of Hazard:</b> <b>2.1 Vehicle Performance</b> <ul style="list-style-type: none"><li>• Train reliability</li><li>• Vehicle reliability</li><li>• Component reliability</li><li>• System reliability</li><li>• Control system performance</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The installation design has been produced in accordance with the system suppliers Interface Control Document.	
ICD-1051-01	

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 018	
<b>Description of Hazard:</b> <b>2.1 Vehicle Performance</b> <ul style="list-style-type: none"> <li><b>Maintenance periodicity</b></li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>New maintenance tasks will be required to cover the new equipment. Following supply of generic information from the system supplier this information shall be supplied to Direct Rail Services and West Coast Railways for inclusion into the fleet VMI.</p>	

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 019	
<b>Description of Hazard:</b> <b>2.1 Vehicle Performance</b> <ul style="list-style-type: none"><li>• Acoustic environment</li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The tones made by the equipment are currently under Human Factors review and are yet to be confirmed. These will be developed during user trials.	

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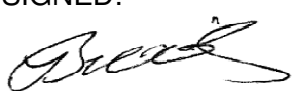

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Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 020	
<b>Description of Hazard:</b> <b>2.1 Vehicle Performance</b> <ul style="list-style-type: none"> <li>Visual environment</li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>The cab installations either replace existing items in current positions, or are positioned in areas occupied by similar equipment.</p> <p>The Type 1 installation junction box is being fitted to the roof of the driver's cab and the Type 2 junction box installation is being fitted to the partition behind the driver's seat. In both cases, the installations present no risk to the performance of the vehicle.</p> <p>The antennas are fitted externally to the bonnet of the vehicle.</p>	MP-C0-00067 MP-C0-00068 MP-C0-00069 MP-C0-00077

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 021	
<b>Description of Hazard:</b> <b>2.1 Vehicle Performance</b> <ul style="list-style-type: none"> <li><b>Ergonomic needs</b></li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>The CDR has been assessed against Human Factors criteria.</p> <p>The handset has been assessed against Human Factors criteria.</p>	<p>MP-C0-00067 MP-C0-00068</p> <p>Survey Report: MP TECHREP 014</p> <p>Ergonomic Evaluation Drawings: MP-C0-00022 MP-C0-00023 MP-C0-00024 MP-C0-00025</p>

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ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 022	
<b>Description of Hazard:</b> <b>2.1 Vehicle Performance</b> <ul style="list-style-type: none"> <li>• Heating/cooling performance</li> </ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
<p>Due to the low voltage supply, the equipment installations are considered to have a negligible effect on the heating and cooling performance of the vehicle.</p> <p style="text-align: right;">ICD-1051-01</p> <p>The mounting positions for the new equipment have been selected as optimum locations to minimise environmental influences including temperature.</p> <p>The RETB installations have been undertaken in accordance with the Interface Control Document</p>	

## CLOSE OUT

CREATED:	DATE:	CHECKED:	DATE:
<b>J. Brookling</b>	<b>November 2014</b>	<b>M. Hoptroff</b>	<b>November 2014</b>
SIGNED:			
			

# HAZARD CLOSEOUT SHEET



NOVEMBER 2014

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Job No: <b>MP/13/002</b>	Assignment Title: <b>Class 37 RETB Installation</b>		
ECR No:	HICL No: MP HAZ ID 004		
Raised by: <b>M. Hoptroff</b>	Date Raised: November 2014	Hazard No: 023	
<b>Description of Hazard:</b> <b>1.9 Off vehicle/ Infrastructure Hazards</b> <ul style="list-style-type: none"><li>• <b>Hearing Damage</b></li></ul>			

ACTION TO CLOSE OUT	REFERENCE DOCS.
The speaker type has been used for the GSM-R installation and the system has been specified to provide performance consistent with the NRN system. The risk of hearing damage is therefore not considered to be a risk.	

## CLOSE OUT

CREATED: <b>J. Brookling</b>	DATE: <b>November 2014</b>	CHECKED: <b>M. Hoptroff</b>	DATE: <b>November 2014</b>
SIGNED: 