



Gloucestershire Warwickshire Steam Railway Plc
Risk Assessment for Fitting, removal, storing and recharging of Carriage Batteries - Carriage and Wagon

Risk Assessment - Fitting, removal, storing and recharging of Carriage Batteries

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Department: Carriage and Wagon
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Moving and transporting batteries

Type	Hazard Cause	Persons Affected	Control Measures	L Overall	S	T	Additional Control Measures	L Overall	S	T	Owner/Action
Health and Safety	Musco-skeletal injury Failure to adopt correct Manual Handling process	Volunteers & Staff	1) CRITICAL - Administrative: Training given in Manual Handling Techniques - Effective 2) CRITICAL - Administrative: Be aware of your own limitations. - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a
Health and Safety	Crush injury to hands or feet Dropping battery (weight approx.46-48kg) on to hand/foot	Volunteers & Staff	1) CRITICAL - Engineering: Batteries always to be lifted by two persons - Effective 2) CRITICAL - PPE: Mandatory to wear safety footwear, overalls and gloves. - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a

Fitting and removal of batteries from rail carriage

Type	Hazard Cause	Persons Affected	Control Measures	L Overall	S	T	Additional Control Measures	L Overall	S	T	Owner/Action
Health and Safety	Musco-skeletal injury Failure to adopt correct manual handling techniques	Volunteers & Staff	1) CRITICAL - Administrative: Manual handling training given - Effective 2) CRITICAL - Administrative: Be aware of your own limitations. - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a



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Type	Hazard Cause	Persons Affected	Control Measures	L Overall	S	T	Additional Control Measures	L Overall	S	T	Owner/Action
Health and Safety	Crush injury to hands or feet Batteries have to be manouevered into battery box	Volunteers & Staff	1) CRITICAL - Engineering: Two persons to lift the batteries at all times. - Effective 2) CRITICAL - PPE: Safety footwear, overalls and gloves to be worn. - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a
Health and Safety	Electric shock Shorting of terminals or incorrect fitting	Volunteers & Staff	1) CRITICAL - Engineering: Batteries used are either 6v or 12v. Connected in series max. 24v - below 120v required for electrical shock - Effective 2) CRITICAL - Engineering: Terminals of batteries are shielded from each other during fitting and removal - Effective	1 x 1 = 1 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			1) Engineering: Consider the use of tools that are plastic coated to avoid shorting on terminals. - Effective 2) Administrative: Be aware of the risk of wearing jewellery that could short out terminals. - Effective	1 x 1 = 1 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a
Health and Safety	Chemical Burn Accidental release of (sulphuric) battery acid due to leakage from the casing or unsecured filler caps	Volunteers & Staff	1) CRITICAL - Administrative: Eye Wash kit available - saline solution to irrigate eyes/wash off skin - Effective	1 x 2 = 2 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			1) PPE: Consider wearing safety eyewear. - Effective	1 x 2 = 2 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a
Environmental	Chemical Release causing ground contamination Leakage from battery casing or spillage during topping up	Volunteers & Staff	1) CRITICAL - Engineering: Do not store cells on unmade ground. - Effective 2) CRITICAL - Administrative: Chemical 'Spill Kit' available - Effective	1 x 1 = 1 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	1 x 1 = 1 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a

Storage and Recharging of Carriage Batteries



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Type	Hazard Cause	Persons Affected	Control Measures	L Overall	S	T	Additional Control Measures	L Overall	S	T	Owner/Action
Health and Safety	Chemical burn Acid splash	Volunteers & Staff	1) CRITICAL - Engineering: All carriage batteries not mounted on rail vehicles to be moved to the secure battery store container - Effective 2) CRITICAL - Administrative: Eye wash readily available - Effective 3) CRITICAL - PPE: Coveralls, safety glasses and gloves worn - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a
Health and Safety	Slips/Trips/Falls Battery blocking/obstruction walkway	Volunteers & Staff	1) CRITICAL - Engineering: All carriage batteries not mounted on rail vehicles to be moved to the secure battery store container - Effective 2) Administrative: Battery recharging undertaken out of main walkway route - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a
Health and Safety	Explosion causing personal injury Explosive gases are produced during the recharging process.	Volunteers & Staff	1) CRITICAL - Elimination: All battery charging undertaken in well ventilated area - Effective 2) Elimination: Use of Smart Chargers controls the charging cycle to significantly reduce likelihood of hydrogen gas release - Effective 3) CRITICAL - Engineering: All carriage batteries not mounted on rail vehicles to be moved to the secure battery store container - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a
Health and Safety	Electric shock Incorrect fitting of battery, shorting of exposed terminals	Volunteers & Staff	1) CRITICAL - Engineering: When laid up (storage) battery terminals are protected with insulated caps - Effective 2) CRITICAL - Engineering: All carriage batteries not mounted on rail vehicles to be moved to the secure battery store container - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a
Environmental	Land or ground water contamination Leakage of battery acids	Public	1) Engineering: Transitioning to use of Gel batteries - Effective 2) CRITICAL - Engineering: All carriage batteries not mounted on rail vehicles to be moved to the secure battery store container - Effective 3) Administrative: Maintenance of wet (lead/acid) batteries undertaken by two persons to reduce risk of acid spill - Effective 4) Administrative: Redundant batteries are stored in isolation and disposed off through a licensed waste disposal contractor - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			None	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.			n/a



COSHH Assessments

There are no COSHH assessments associated with this risk assessment.

Reference Documents

- Victron Battery MSDS -
- Exide Battery - MSDS -
- MSDS Trojan Battery -

Ends