Risk Assessment - Operation of machinery near/underneath overhead electric wires

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Using excavators, diggers, telehandlers, the RRV, or any other form of mechanised machinery capable of lifting materials near to, or underneath overhead electricity cables.

Department: Permanent Way
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Contact/Collision with Overhead Infrastructure: Personal Injury

Type	Hazard Cause	Persons Affected	Control Measures	L S T Overall	Additional Control Measures	L S T Overall	Owner/Action
Health and Safety	Electric Shock, Burns or Death Working too close to, or accidental contact with electrical wires causing injuries such as shock, burns (internal and external) or possibly death.	Volunteers & Staff	1) CRITICAL - Elimination: Do not work with lifting machinery near to, or underneath overhead electric cables where possible. - Effective 2) Engineering: Use non-conductive tooling if possible. - Improvable 3) CRITICAL - Administrative: Follow the safety measures set out in the "Look Out! Look Up" booklet - Effective 4) CRITICAL - Administrative: Do not work near to, or underneath, overhead electric cables during wet, damp or humid conditions (rain, sleet, snow, fog). - Effective 5) Administrative: If an RCI, lift or slew lock device is fitted to the machine to prevent accidental over-lift, this should be set and not over-ridden. - Effective 6) Administrative: Any member of staff, or volunteer, who has a pacemaker fitted should be kept away from working near (or under) overhead power lines, especially those close to the ground or high voltage lines, to prevent risk of damage or interruption to the device caused by electromagnetic interference. - Effective 7) CRITICAL - PPE: Ensure correct (and any additional, as required) PPE is worn when working near to, or underneath overhead electric lines. - Effective	2 x 5 = 10 Medium - Risk to be minimised and controlled so far as is reasonably practical.	1) Elimination: If works are to be prolonged, liaise with the Distribution Operator to request a disconnection of the electrical supply [note: not always possible, but is the safest option] - Improvable 2) Administrative: First Response Team are available to call if required : 07395 448213 - Effective 3) Administrative: Seek immediate emergency response via 999 [ambulance] if person suffers electrical shock or burns. - Effective	2 x 3 = 6 Medium - Risk to be minimised and controlled so far as is reasonably practical.	n/a

Weather

Type	Hazard Cause	Persons Affected	Control Measures	L S T Overall	Additional Control Measures	L S T Overall	Owner/Action
Health and Safety	Damp/Wet/Humid Weather Fog, Rain, Snow, Sleet, Hail, etc., causing an increase of potential conductivity of plant, machinery, materials, components and workers.	Volunteers & Staff	1) Elimination: Working near to, or underneath overhead power lines during periods of wet weather is not recommended. - Effective 2) CRITICAL - Elimination: If an RCI, lift or slew lock device is fitted to the machine to prevent accidental over-lift, this should be set and not over-ridden. - Effective 3) CRITICAL - Administrative: If work is necessary, for example in an emergency situation, work should only take place once an additional dynamic risk assessment has taken place and been formally recorded. - Effective	2 x 4 = 8 Medium - Risk to be minimised and controlled so far as is reasonably practical.	1) Administrative: First Response Team are available to call if required : 07395 448213 - Effective	2 x 4 = 8 Medium - Risk to be minimised and controlled so far as is reasonably practical.	n/a
Health and Safety	Heat Hot weather causing sagging of wires due to thermal expansion reducing height of cables to ground level.	Volunteers & Staff	1) CRITICAL - Elimination: If an RCI, lift or slew lock device is fitted to the machine to prevent accidental over-lift, this should be set and not over-ridden. - Effective 2) Engineering: Risk of lowered (when measured from the ground) exclusion zone being breached. If possible, use the AR600E meter to record cable heights immediately prior to lifts for more accuracy. - Improvable	2 x 4 = 8 Medium - Risk to be minimised and controlled so far as is reasonably practical.	1) Elimination: First Response Team are available to call if required : 07395 448213 - Effective	2 x 4 = 8 Medium - Risk to be minimised and controlled so far as is reasonably practical.	n/a

Type	Hazard Cause	Persons Affected	Control Measures	L S T Overall	Additional Control Measures	L S T Overall	Owner/Action
Health and Safety	Wind Movement of electrical cables and/or instability of lifted equipment	Volunteers & Staff	1) Administrative: During times of high wind, two areas of risk increase: (1) The power cables can sway and swing in an unpredictable manner; (2) The load being lifted is at risk of becoming uncontrolled, especially those with a large surface area. This may also result in the lifting equipment (e.g. strops) becoming over-stressed and damaged, and the machine itself is at risk of becoming unstable. - Effective	2 x 4 = 8 Medium - Risk to be minimised and controlled so far as is reasonably practical.	1) Elimination: It is recommended that during times of high winds – those in excess of 20mph – general lifting operations, but especially those taking place near or underneath overhead electricity cables, be suspended. - Effective 2) Administrative: First Response Team are available to call if required : 07395 448213 - Effective	2 x 2 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.	n/a
Health and Safety	Dark Work taking place at night, or during times of poor visibility	Volunteers & Staff	1) CRITICAL - Elimination: Working in hours of darkness is discouraged and never planned unless it is an absolute emergency. - Effective 2) CRITICAL - Elimination: Allow more frequent rest periods rather than long working periods. - Effective 3) CRITICAL - Engineering: During hours of reduced visibility, or during darkness, overhead cables can be nearly invisible, and so special care and attention should be paid to working near or around locations with live overhead wires. - Effective 4) CRITICAL - Administrative: Fatigue : Studies show mistakes are statistically more likely to happen at night due to a combination of biological, cognitive, and environmental factors—a phenomenon sometimes referred to as the "Mind after Midnight" hypothesis. During late-night hours, alertness drops, the brain's ability to process information slows, and emotional regulation decreases, increasing the likelihood of poor decisions and errors. - Effective	1 x 5 = 5 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.	1) Engineering: Consider highlighting dangerous working areas using beacons, lights or strobes, as a visual reminder to operatives of the presence of electric cables. - Improvable	1 x 5 = 5 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.	n/a

Contact/Collision with Overhead Infrastructure: Financial Impact

Type	Hazard Cause	Persons Affected	Control Measures	L S T Overall	Additional Control Measures	L S T Overall	Owner/Action
Finance	Commercial Claims bought to the Railway by National Grid/Electricity Supplier for damaged infrastructure and/or compensation for equipment damaging private property.	Volunteers & Staff	1) CRITICAL - Engineering: If an RCI, lift or slew lock device is fitted to the machine to prevent accidental over-lift, this should be set and not over-ridden. - Effective 2) CRITICAL - Administrative: Reduce the risk of liability for damaging utility equipment from machinery or materials being lifted by keep booms or jibs low and well within the exclusion zones outlined in the Look Out! Look Up! booklet. - Effective 3) CRITICAL - Administrative: Ensure all reasonable precautions are taken to prevent contact with electrical infrastructure. - Effective 4) CRITICAL - Administrative: The PIC should ensure all staff working with or around machinery near to or underneath electrical cables are fully briefed on the additional risks prior to works starting. - Effective	2 x 4 = 8 Medium - Risk to be minimised and controlled so far as is reasonably practical.	1) Elimination: Consult the Distribution/Networ Operator to see if it is possible for the electrical lines to be disconnected during prolonged periods of work near to or underneath overhead electric cables routes. - Improvable	1 x 4 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.	n/a

Gloucestershire Warwickshire Steam Railway Plc
Risk Assessment for Operation of machinery near/underneath overhead electric wires - Permanent Way

Type	Hazard Cause	Persons Affected	Control Measures	L S T Overall	Additional Control Measures	L S T Overall	Owner/Action
Finance	Civil Claims bought to the Railway by injured person or their famiy	Volunteers & Staff	1) CRITICAL - Elimination: Staff working near or underneath electrical wires to remain outside the exclusion zones shown in the Look Out! Look Up! booklet. - Effective 2) CRITICAL - Elimination: If advice is received of fault equipment from the Network Operator, this should be disseminated to the P-way Manager and the PICs so that work plans can be altered to prevent any risk of electrocution of any sort. - Effective 3) CRITICAL - Engineering: Where possible, insulated tools should be used when working near or underneath overhead electric cables. - Effective 4) CRITICAL - Engineering: If an RCI, lift or slew lock device is fitted to the machine to prevent accidental over-lift, this should be set and not over-ridden. - Effective 5) CRITICAL - Administrative: Rules set out in the Rule Book and the Guidelines in the Look Out! Look Up! booklet to be followed at all times. - Effective 6) CRITICAL - Administrative: Any member of staff, or volunteer, who has a pacemaker fitted should be kept away from working near (or under) overhead power lines, especially those close to the ground or high voltage lines, to prevent risk of damage or interruption to the device caused by electromagnetic interference. - Effective 7) CRITICAL - PPE: Correct PPE to be work by workers, and enforced by the PIC, when working near, or underneath overhead power lines. - Effective	2 x 4 = 8 Medium - Risk to be minimised and controlled so far as is reasonably practical.	1) Elimination: Avoid planning works underneath or near to overhead electric cables on running days, unless it is a response to an emergency situation. - Effective	1 x 4 = 4 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.	n/a
Finance	Internal Costs incurred with restoring or repairing damage to locomotives or rolling stock either owned by the Railway, or by private individuals.	Volunteers & Staff	1) CRITICAL - Elimination: Working underneath overhead electric cables on operating days should not take place unless in response to an emergency situation. - Effective 2) CRITICAL - Elimination: If work needs to be done near or underneath overhead electric cables on an operating day, a Line Block or a Possession should be in place to ensure no locomotives or stock are in the vicinity. - Effective 3) CRITICAL - Engineering: Reduce the risk of liability for damaging utility equipment from machinery or materials being lifted by keep booms or jibs low and well within the exclusion zones outlined in the Look Out! Look Up! booklet. - Effective 4) CRITICAL - Engineering: If an RCI, lift or slew lock device is fitted to the machine to prevent accidental over-lift, this should be set and not over-ridden. - Effective 5) CRITICAL - Administrative: The PIC should ensure all reasonable precautions are taken to prevent contact with electrical infrastructure. - Effective 6) CRITICAL - Administrative: The PIC should ensure all staff working with or around machinery near to or underneath electrical cables are fully briefed on the additional risks prior to works starting. - Effective	2 x 3 = 6 Medium - Risk to be minimised and controlled so far as is reasonably practical.	1) Elimination: Avoid planning works underneath or near to overhead electric cables on running days, unless it is a response to an emergency situation. - Effective	1 x 3 = 3 Low - Risk to be monitored to ensure it remains adequately controlled to an acceptable level.	n/a

Contact/Collision with Overhead Infrastructure: Ops. Impact

Gloucestershire Warwickshire Steam Railway Plc
Risk Assessment for Operation of machinery near/underneath overhead electric wires - Permanent Way

Type	Hazard Cause	Persons Affected	Control Measures	L S T Overall	Additional Control Measures	L S T Overall	Owner/Action
Health and Safety	Train coming into contact with broken, dropped or fallen electrical infrastructure or wires Severe Weather or Infrastructure Impacted by Machinery	Everyone	1) CRITICAL - Elimination: Staff working near or underneath electrical wires to remain outside the exclusion zones shown in the Look Out! Look Up! booklet. - Effective 2) CRITICAL - Elimination: If work needs to be done near or underneath overhead electric cables on an operating day, a Line Block or a Possession should be in place to ensure no locomotives or stock are in the vicinity. - Effective 3) CRITICAL - Engineering: If an RCI, lift or slew lock device is fitted to the machine to prevent accidental over-lift, this should be set and not over-ridden. - Effective 4) CRITICAL - Administrative: If any machinery or load comes into contact with electricial infrastructure, the Network/Distribution Operator must be informed immediately by calling 105. - Effective 5) CRITICAL - Administrative: Any staff coming into contact with fallen infrastructure to be seen immediately by paramedics, called to site by 999 emergency call. - Effective 6) CRITICAL - Administrative: Operations Director to be informed of any obstructions to the line on non-running days. - Effective 7) CRITICAL - Administrative: DOO and appropriate Signalman to be informed of any obstructions to the line on running days. Staff on site must be prepared to stop any oncoming train in accordance with Section 18 of the Rule Book. - Effective 8) CRITICAL - Administrative: The Rules set out in Section T, Paragraph 3 apply if "Power Lines Foul Railway Lines" - Effective	2 x 4 = 8 Medium - Risk to be minimised and controlled so far as is reasonably practical.	1) Elimination: Avoid planning works underneath or near to overhead electric cables on running days, unless it is a response to an emergency situation. - Effective 2) Administrative: First Response Team are available to call if required : 07395 448213 - Effective	2 x 3 = 6 Medium - Risk to be minimised and controlled so far as is reasonably practical.	n/a
Operations	Closure of Line due to obstruction Fallen Infrastructure	Passengers	1) CRITICAL - Elimination: Staff working near or underneath electrical wires to remain outside the exclusion zones shown in the Look Out! Look Up! booklet. - Effective 2) CRITICAL - Engineering: If an RCI, lift or slew lock device is fitted to the machine to prevent accidental over-lift, this should be set and not over-ridden. - Effective 3) CRITICAL - Administrative: If any machinery or load comes into contact with electricial infrastructure, the Network/Distribution Operator must be informed immediately by calling 105. - Effective 4) CRITICAL - Administrative: Any staff coming into contact with fallen infrastructure to be seen immediately by paramedics, called to site by 999 emergency call. - Effective 5) CRITICAL - Administrative: Operations Director to be informed of any obstructions to the line on non-running days. - Effective 6) CRITICAL - Administrative: DOO and appropriate Signalman to be informed of any obstructions to the line on running days. Staff on site must be prepared to stop any oncoming train in accordance with Section 18 of the Rule Book. - Effective 7) CRITICAL - Administrative: The Rules set out in Section T, Paragraph 3 apply if "Power Lines Foul Railway Lines" - Effective	2 x 3 = 6 Medium - Risk to be minimised and controlled so far as is reasonably practical.	1) Elimination: Avoid planning works underneath or near to overhead electric cables on running days, unless it is a response to an emergency situation. - Effective 2) Administrative: First Response Team are available to call if required : 07395 448213 - Effective	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

- Overhead Lines map -
- 400Kv Overhead Lines at Prescott - Towers ZF295_to_ZF296 -
- Look Out! Look Up! Booklet -

Ends