

DOWNS LIGHT RAILWAY

Safety Management System



Purpose

This document describes the Safety Management System for the Downs Light Railway.

Disclaimer

The author(s) of this document have used best endeavours to ensure that the content of this document is accurate, complete and suitable for its stated purpose. While this document is regularly reviewed by its stakeholders, it remains a static document and should not be used as clearance to operate the Downs Light Railway.

Amendment Record

Issue	Date	Name	Change	Effected Pages
1	Sept 2012	Pennock	Initial issue	All
2	March 2014	Pennock	Updated following RSA review	P5, P17

References

Reference	Title
-	Health and Safety at Work Act etc. 1974
-	Health and Safety at Work Regulations 1999
-	The Railways and Other Guided Transport Systems (Safety) Regulations 2006
-	Pressure System Safety Regulations 2000
-	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013
HSG216	Passenger-carrying miniature railways - Guidance on safe practice
HSG129	Health and safety in engineering workshops
DLRT (2009)	Risk Management Policy / Strategy 2009
DLRT (2012)	Guidance for Children Participating in the Railway Hobbies
DLRT	Risk Register

Contents

Amendment Record	2
References	2
Introduction	4
Safety Policy	4
Organisational Responsibility	5
Risk Assessment and Management	6
Methodology	6
Assessment	6
Safety Assessments.....	7
Competence an Achievement	8
Managing Trustees	8
Medical and Welfare Supervision	8
Locomotive Driver and Guards Qualifications.....	8
Railway Operational Management	9
Notification of Operations	9
Supervision and Control.....	9
Hoyland Down Road Closure	9
Line Inspection and Fit for Purpose.....	9
Locomotive and Rolling Stock Movements.....	10
Railway Maintenance Management	12
Track Work Maintenance	12
Locomotive Inspections.....	12
Rolling Stock Inspections	13
Workshop Usage	13
Changes to the asset base.....	14
New assets	14
Loaned hired or visiting assets.....	14
Occurrence Prevention, Management and Reporting.....	15
Inclement Weather/Conditions	15
Emergency Planning for Large Events	15
Management and Reporting.....	15
Appendix A – DLR Areas of Responsibility.....	17
Appendix B – Example Risk Register	19
Appendix C – Example Educational Learning Matrix	20

Introduction

1. The Downs Light Railway (DLR) is a ground-level miniature railway, situated within the grounds of The Downs Malvern (The Downs, Malvern College Preparatory) (TDM). The railway, established in the 1920s, is an educational facility for children to broaden their engineering, team working and leadership. Part of this educational role teaches the children about the practicality of managing risk. In addition, the children by virtue of their competence and experience are encouraged to proactively support the railway's culture of safety and risk management.
2. The DLR has a track gauge of 9.5 inches (241.3mm). It does not cross a carriageway and is exempt from *The Railways and Other Guided Transport Systems (Safety) Regulations 2006*. However, for enhanced governance the DLR has an established Safety Management System (SMS), taking guidance from the Heritage Railway Association and Health and Safety Executive.

Safety Policy

3. The DLR is unique in that it is the largest miniature railway within the UK operated by children, for the purposes of their education. In addition to its exclusive historical importance, the DLR is seen as a benchmark facility for other educational establishments and heritage preservation societies engaging young people and children with the maintenance and operational environment of railways.
4. Miniature railways and workshop facilities are not without serious risks and potential consequences in comparison to their larger counterparts. One of the prime educational value drivers of the DLR is the learning of risk and the realities of disregarding mitigating control measures. Trivial and minor injury is fundamentally regarded part of this safety ethos, encapsulated by a rigorous level of supervision and strict compliance with regulatory policies and statutory acts of parliament. While the DLR is entitled to grandfather rights, where appropriate, it aims to follow the approved national guidelines for miniature railway construction, maintenance, operation and workshop practices.
5. The DLR is seldom run for members of the general public for purposes of entertainment. However, opportunities and events arise when the DLRT and TDM may choose to operate the DLR in a passenger carrying role for such groups. The DLR recognises the significant differences between railway operation for educational purposes and public passenger running. In all cases, risk is required to be as low as reasonably practicable (ALARP) and the overall risk assessment declared tolerable (paragraph 15). The ALARP status for educational purposes and ALARP status for non-educational running are categorised separately.

Organisational Responsibility

6. In 1983, the DLRT was formed as a charitable independent organisation. The asset ownership of the DLR was handed to the DLRT by the Board of Governors of the Downs School, Colwall (Registered Charity 527581 and former school to the current TDM). Consequently, the DLRT became the operating authority on behalf of the Downs School for the DLR.

7. The SMS for the DLR involves both organisational entities as described in Figure 1.

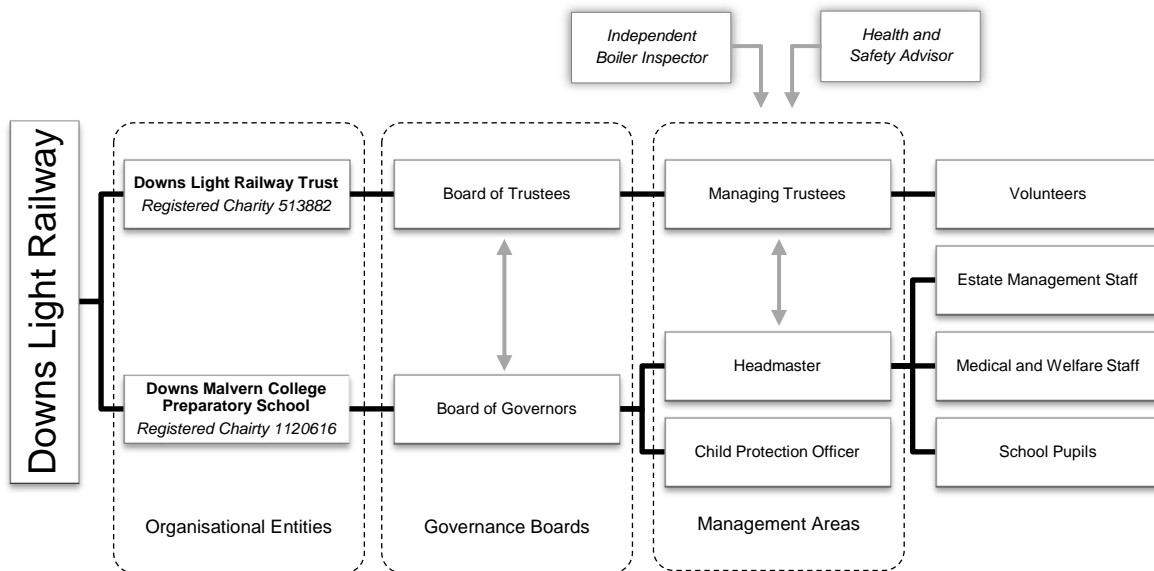


Figure 1 - DLR Organisational Structure

8. The DLRT's Board of Trustees is made up of suitably experienced and qualified individuals covering a mixture of education, health and safety, miniature and light railway, and industrial engineering professions. For the purposes of the maintenance of the DLR and operational activities, the DLRT's Board of Trustees are considered the Subject Matter Experts (SMEs) in the prime context of the SMS.

9. The DLRT's Board of Trustees includes a co-author of the Health and Safety Executive (HSG216) Passenger-carrying miniature railways - Guidance on safe practice.

10. The areas of responsibility for the effective execution of this SMS for the DLR are outlined in Appendix A – DLR Areas of Responsibility, Table 2.

- END OF SECTION -

Risk Assessment and Management

Methodology

11. The DLR understands the serious risks and potential consequences of operating a miniature railway with children. The DLR seeks not only to manage the risks associated with its activities, but to teach the children practically about managing these risks. In addition to the supervising adults, senior children by virtue of their competence and experience are encouraged to proactively support the railway's culture of safety and risk management.

12. Children are warned of the specific dangers with each activity. In the controlled environment of the DLR, it is recognised that the personal experience and resulting pain from a minor skin burn teaches respect for both the locomotive and safety warnings. A child that carelessly hits his finger with a hammer soon learns how to use the tool appropriately. A child that uses the wrong spanner and grazes their knuckles learns to select the correct spanner. A child that does not check the turnout switch blades are correctly set will learn a new skill of re-railing heavy equipment along with the need to double check.

Assessment

13. Risks relating to the operation of the DLR have been formally assessed and managed over a number of years. The Managing Trustees maintain a Risk Register that details all assessed risks and outlines the control measures necessary to achieve ALARP states. The Risk Register (example in Appendix B – Example Risk Register) uses a 5X5 assessment matrix as described in Figure 2 and the risk level determined by Table 1 .

	Improbable (1)	Possible (2)	Occasional (3)	Frequent (4)	Regular (5)	
Trivial (1)	1	2	3	4	5	Injury that does not require first aid
Minor (2)	2	4	6	8	10	Injury requiring first aid
Medium (3)	3	6	9	12	15	Injury requiring formal medical attention
Major (4)	4	8	12	16	20	Injury requiring hospital treatment
Catastrophic (5)	5	10	15	20	25	Death of permanent disablement
	Unlikely to happen	Every 5-years	Every 1-year	Every 3-months	Every time	

Figure 2 - 5x5 Risk Matrix

Rating	Category	Approach
1-3	Tolerable	Activity acceptable, controls are reviewed periodically.
4-6	Moderate	Activity acceptable, controls are reviewed regularly.
8-12	Substantial	Activity should be carried out on exceptional case-by-case basis, after a specific review of the control mitigations.
15-25	Intolerable	Activity is not permitted.

Table 1 - Risk Levels

14. As part of continued maintenance of the railway, improvements and upgrades are planned with the view of removing or reducing the consequence of the risks. The Risk Register is reviewed by the Managing Trustees and updated on a regular basis. Significant changes to the Risk Register are presented to the Board of Trustees triggering a safety assessment.

Safety Assessments

15. A full assessment of the DLR is conducted at the specific request of the DLRT Board of Trustees or as follow up to an incident. Periodically, the Board of Trustees will request an independent assessment.

16. A full assessment of the DLR was last carried out in 2009 and concluded that all risks were managed to acceptable levels within the operation of the railway.

- END OF SECTION -

Competence and Achievement

Managing Trustees

17. Managing Trustees are appointed by the DLRT Board of Trustees to make operational decisions on behalf of the DLRT. Such individuals are suitably experienced and qualified to operate and manage the maintenance of the DLR. Such individuals are usually owners of railways, or possess appropriate professional engineering or technical trade qualifications. These individuals act as DLR Supervisors.

Medical and Welfare Supervision

18. TDM Head of Departments are responsible for the provision of staff to provide medical and welfare supervision for all children who are engaged in the educational activity of the DLR. Such members of staff are employed by TDM and who are specifically experienced and qualified to work with children.

19. The DLR takes serious consideration to children who do not have English speaking and listening as their first language, and those who possess learning difficulties or behavioural problems. TDM has an obligation to inform the DLRT of such children, to ensure that the risks are known and the recommended levels of supervision put in place for the activities scheduled during the educational sessions.

20. Guidelines for children taking part on the DLR are provided to the Heads of Department by the DLRT, titled *Guidance for Children Participating in the Railway Hobbies*.

Locomotive Driver and Guards Qualifications

21. Two different forms of motive power are used on the DLR, steam and internal combustion. Locomotive Driver qualifications are awarded for drivers after being assessed as competent by a Managing Trustee in all aspects of the locomotive's operation. Such drivers are permitted to passenger haul trains and provide driving instruction to unqualified individuals. The DLR places no age requirement on qualified Drivers.

a. Children who are awarded Driver qualifications on steam locomotives are awarded a red neckerchief, but are routinely assessed for currency and supervised.

b. Children who are awarded Driver qualifications on internal combustion locomotives are awarded a blue neckerchief, but are routinely assessed for currency and supervised.

22. Guard qualifications are awarded after being assessed as competent by a Managing Trustee in all aspects of the guarding a train with passengers and goods.

a. Children who are awarded Guard qualifications are awarded a lapel badge.

- END OF SECTION -

Railway Operational Management

23. The current operating protocol for the DLR was established between the DLRT and TDM in 2008 as a safeguarding measure for both organisational entities.

Notification of Operations

24. Events planned by the TDM to use the DLR are made to the DLRT. Requests will be ratified by the DLRT and approved on a on a case-by-case basis, subject to serviceability and available supervision.

25. During the academic term periods, the DLRT will inform TDM Headmaster or his deputy of intentions to operate the DLR outside the scope of the Saturday Morning Hobbies, regardless of whether it is for maintenance or recreational operation.

Supervision and Control

26. To operate the DLR, an DLR Supervisor must be present along with at least one competent person. Operation of the DLRT's locomotives is permitted by a qualified driver under the direction of a DLR Supervisor.

- a. A competent person is an individual who have been assessed by a Managing Trustee of the DLRT as having the necessary understanding and competency to assist in all activities on the DLR.
- b. A qualified driver is an individual who have been trained in the operation of a DLRT Locomotive, has passed a competence check, and has been approved on the specific locomotive.
- c. A qualified guard is an individual who has been trained in the connection, safety checks and passenger briefings of train combinations.

27. When young persons or children are actively taking part in activities on the DLR and steam locomotives are in operation, two qualified drivers must be on site at all times. The ratio of one qualified driver to six unqualified young people or children should never be exceeded.

Hoyland Down Road Closure

28. When locomotives, rolling stock or trains are in operation at the Hoyland Down terminus, the private road crossing the railway adjacent to the Hoyland Down station is to be closed off using road cones. Reopening of this road must only be done with approval from a DLR Supervisor.

Line Inspection and Fit for Purpose

29. The Managing Trustees are responsible for assessing the DLR track work and associated infrastructure at no more than three-month intervals.

- a. Any hazards along the permanent way are to be entered on the Risk Register.
- b. The Managing Trustees reserve the right to declare the railway, or parts thereof, unfit for use until the assessed risks have been controlled.

30. Prior to any movements on suitably fit areas of the DLR, a visual inspection is to be carried out by two competent people to ensure that no obstructions exist on the line.

31. The Brockhill Road tunnel structure is to be visually inspected annually by the Managing Trustees or if a heavy load has been reported using the unadopted road above.

32. The Estates Department of TDM is responsible for the formal structural inspections of the Brockhill Road tunnel.

Locomotive and Rolling Stock Movements

33. No locomotives, rolling stock, or train combinations are to be moved unless in the presence of a DLR Supervisor.
34. Prior to moving a locomotive under its own power, the driver is to clearly blow one blast of the locomotive's whistle or horn. This signifies the locomotive is about to move.
35. Prior to moving a train combination using a locomotive, the guard is to satisfy himself that any passengers have been appropriately briefed and that the couplings have been fitted and checked. On completion of his safety checks, the guard is to clearly blow one blast of his whistle. This signifies to the driver that the train is ready to move. The driver is then to follow the procedure outlined in paragraph 34.
36. A heightened risk of derailment exists when locomotives or rolling stock traverse a turnout. Unless a suitable method for locking the switch rails of the turnout is available, the turnout point levers are to be positively held in place by a competent individual.

Emergencies Distress Signals

37. Should a train combination derail, the guard is to clearly blow three blasts of his whistle. The driver on hearing three blasts is to bring the train to a halt.
38. Should a locomotive running light derail, the driver is to remain with the locomotive and clearly blow three long blasts on the locomotive's whistle or horn. In a double headed combination, the drivers are to remain with the locomotives. The locomotive with the louder whistle or horn should make the distress signal.

Tunnel

39. A significant danger exists from the Brockhill Road tunnel. This is largely related to adult drivers and passengers who may have to lower their heads in order to clear the tunnel roof. However, a similar risk exists from passengers who fail to keep their arms and legs within the confines of the carriages or locomotives.
40. All trains approaching the east mouth of the tunnel are required to stop, where a verbal warning is given to all passengers by the guard. Special attention is given when visitors are unaware of the risk.
41. Trains approaching the west mouth of the tunnel are not required to stop. A heightened risk of derailment or coal sparks deflecting off the tunnel roof exists if the train was required to restart on the steep track gradient.
42. All locomotives or train combinations are required to clearly blow their whistle or horn prior to entering the tunnel from either direction.

Block Token Systems

43. Due to significant blind spots, an inherent collision risk exists when one or more locomotives, rolling stock or train combinations are in use across the DLR main circuit. Track maintenance groups are also vulnerable from collision hazards associated with unknown movements. When more than one movement is scheduled in any given period, the DLR is split into two main sections and a Block Token System is activated.
- a. **Red Section.** The red section consists of the northern cuttings, tunnel and Brockhill coppice between the Hoyland Down home signal and the turnout adjacent to the ballast siding. Prior to entering this section, locomotive drivers or rolling stock handlers must be in possession of a Red Token.
 - b. **Green Section.** The green section consists of the circuit around Brock Meadow. Prior to entering this section, locomotive drivers or rolling stock handlers must be in possession of a Green Token.

c. **Neutral Sections.** The railway between these two sections contains no blind spots and is deemed to be neutral.

44. Hoyland Down is protected by a home lower-quadrant semaphore signal. The signal is set to Red/Horizontal by default and requires specific activation when entry into the terminus required.

- END OF SECTION -

Railway Maintenance Management

45. The maintenance of the DLR is the responsibility of the DLRT for all railway assets, and TDM for all land infrastructure and buildings. Where practicable, both organisations are required to follow the Health and Safety Executive Guidelines (HSG216) for infrastructure and railway maintenance good practices.

Track Work Maintenance

46. Light construction and maintenance of the track work is conducted by the school pupils or volunteers. Prior to locomotive or train movements, track work is inspected by a Managing Trustee. Track work is supported and levelled by 25-40 mm clean ballast.

Locomotive Inspections

47. All locomotives in-service are mechanically inspected annually and serviced prior to use. Serviceability states of the locomotives are presented to the Board of Trustees.

Steam Locomotive Boilers

48. The most serious and potentially catastrophic risk on the DLR relates to boiler explosions. All steam locomotives operating on the DLR are required to hold a valid boiler certificate from an independent inspector. The maintenance of all steam locomotive boilers are required to satisfy the *Pressure System Safety Regulations 2000*.

49. Acquisition of a replacement boiler is done in accordance with the *Pressure System Safety Regulations 2000*.

a. The design of new steam locomotive boilers is certified by an Insurance Surveyor. New boilers are constructed by reputable builders and include the necessary material certificates and weld inspection certificates. Prior to receipt by the DLRT, the boiler is certified by an Insurance Surveyor.

b. Prior to assembly onto the locomotive, the boiler and its associated fittings are hydraulically pressure tested to twice the declared working pressure by an independent boiler inspector.

c. Once assembled, the boiler is given a thorough steam test at full working pressure by an independent boiler inspector.

50. In-service boilers are maintained in accordance with the *Pressure System Safety Regulations 2000*.

a. Annual inspection of the boiler structure, via visual and ultrasound non-destructive testing, is carried out by an independent boiler inspector.

b. Annual steam test is carried out to full working pressure by an independent boiler inspector.

c. Every ten years, the boiler is removed from the locomotive and given a thorough inspection by an independent boiler inspector.

51. Boiler inspection records and test certificates are retained in the DLRT archives for the entire life of the boiler. Inspection records and test certificates of non-DLRT owned locomotives are retained for the period that the locomotive operates on the DLR. Copies of the annual certificate are prominently displayed at Hoyland Down.

52. Steam pressure gauges are sent away for calibration and servicing intervals recommended by the independent boiler inspector. Calibration certificates are held with the boiler inspection records.

53. All in-service steam boilers following a strict husbandry regime to ensure service longevity and efficiency.
- a. Boilers are steamed gradually from cold to mitigating excessive thermal stress.
 - b. Boilers are steamed with Heatreat 502 to mitigate corrosion, scaling and organic fouling. At the cessation of use, the boilers are blown down to at least half the capacity of the boiler to remove any loose deposits.
 - c. Boilers are drained when freezing temperatures are expected. Prior to entering winter storage conditions, the boilers are thoroughly washed out. All plugs and safety valves are removed to ensure sufficient ventilation.
54. All steam locomotives are operationally tested prior to use.
- a. The locomotive is steamed to full working pressure to ensure the safety valves are operating satisfactorily.
 - b. The water sight glass is tested to ensure accurate levels are recorded and shut off taps function correctly. It is a requirement of the DLR that safety shields are fitted to all water sight glasses.
 - c. Two independent water feeds are tested to ensure adequate operation.

Rolling Stock Inspections

55. All rolling stock in-service are inspected annually and serviced prior to use.

Workshop Usage

56. The Hoyland Down Workshop fails to comply with Health and Safety Executive Guidelines (HSG129) for Engineering Workshops.
- a. Machining is prohibited.
 - b. Paint spraying is prohibited.
 - c. Hazardous manual handling is prohibited.
57. Portable electrical machinery requires a specific risk assessment prior to use.
58. Component assembly/disassembly and hand tools are permitted.

- END OF SECTION -

Changes to the asset base

New assets

59. New locomotives and rolling stock are subject to approval by the Board of Trustees. New assets will undergo commissioning to the satisfaction of Managing Trustees.

60. New steam locomotives are to be compliant with paragraph 49.

Loaned hired or visiting assets

61. Loaned, hired or visiting locomotives may use the DLR subject to the approval of the Managing Trustees. Steam locomotives are to be compliant with paragraph 50. Operation of visiting locomotives and rolling stock is permitted under the supervision of a Managing Trustee.

- END OF SECTION -

Occurrence Prevention, Management and Reporting

Inclement Weather/Conditions

62. Movement of locomotives, rolling or trains on the DLR are prohibited over flooded areas (where the base web of the rail is under water) or in snow (where the head of the rail is covered). Traversing turnouts is prohibited where the switch blades are partially restricted by ice or snow.
63. Maintenance activities are to cease in severe weather or extreme temperatures for the United Kingdom.

Emergency Planning for Large Events

64. The DLRT and TDM are to outline specific emergency procedures for events that exceed the normal scope of an internal school event. Such procedures are the result of a risk assessment specific to the event. All key Managing Trustees and TDM Heads of Department are to be suitably briefed.

Management and Reporting

65. All activities on the DLR are to cease in the following situations:
- a. Severity-3 accidents resulting from inadequate supervision, structural failure, or component failure of locomotives, rolling stock, track work or signalling during operation.
 - b. Derailments.
 - c. Fires or explosions.
 - d. Chemical spillage.
66. Managing Trustees may grant activities to recommence if:
- a. An investigation has been carried out and the causes established.
 - b. Recommencing the activity will not result in a repeat occurrence.
 - c. Sufficient supervision remains in place.
67. For severity 4-5 accidents, serious occurrences or work related accidents, all activities cease. Formal reporting is to be carried in accordance with the *Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013*, via the Health and Safety Executive RIDDOR online reporting (<http://www.hse.gov.uk/riddor/report.htm>).
68. Unless directed by the Health and Safety Executive, there is no regulatory requirement for the Rail Accident Investigation Branch to investigate accidents or incidents on the DLR.

- END OF SECTION -

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Appendix A – DLR Areas of Responsibility

Area	Responsibilities
Downs Light Railway Trust	<ul style="list-style-type: none"> ▪ Culpable entity
Downs Malvern College Preparatory	<ul style="list-style-type: none"> ▪ Culpable entity
Board of Trustees	<ul style="list-style-type: none"> ▪ Railway asset owner ▪ Responsibility for the protection of DLR volunteers as defined under the <i>Health and Safety at Work Regulations 1999</i> and <i>Health and Safety at Work Act etc. 1974</i>. ▪ Joint responsibility for the protection of young persons and children as defined under the <i>Health and Safety at Work Regulations 1999</i> and <i>Health and Safety at Work Act etc. 1974</i>. ▪ Responsibility for the protection of members of the public while exposed to risks associated with the railway's assets.
Board of Governors	<ul style="list-style-type: none"> ▪ Land infrastructure owner ▪ Responsibility for the protection of their employees as defined under the <i>Health and Safety at Work Regulations 1999</i> and <i>Health and Safety at Work Act etc. 1974</i>. ▪ Joint responsibility for the protection of young persons and children as defined under the <i>Health and Safety at Work Regulations 1999</i> and <i>Health and Safety at Work Act etc. 1974</i>. ▪ Responsibility for the protection of members of the public while exposed to risks associated with the land infrastructure of the Downs Malvern College Preparatory.
Managing Trustees	<ul style="list-style-type: none"> ▪ Responsible for the maintenance of the railway assets in accordance with the associated regulatory directives and recommended good practices. ▪ Responsible for the safe operation of the railway assets as suitably experienced and qualified individuals. ▪ Responsible for the supervision of volunteers and the general public.
Headmaster	<ul style="list-style-type: none"> ▪ Responsible for the supervision of the estates management staff to enable effective management of the land infrastructure. ▪ Responsible for the management of the medical and welfare staff. ▪ Responsible for the pupils of the Downs Malvern College Preparatory.
Child Protection Officer	<ul style="list-style-type: none"> ▪ Responsible for the implementation and management of child protection safeguards. ▪ Responsible for the criminal record checking of all adults involved in close supervision of young persons and children.
Volunteers	<p>Defined as adults and young persons under the organisational structure of the Downs Light Railway Trust.</p> <ul style="list-style-type: none"> ▪ Accountability for the responsibilities to themselves and others under the <i>Health and Safety at Work etc. Act 1974</i>. ▪ Responsible for the supervision of themselves and others when suitably experienced and qualified.

Safety Management System

	<p>Adult Volunteers (specifically)</p> <ul style="list-style-type: none">▪ Responsible for the welfare supervision of young persons and children under their care.
Estates Management Staff	<ul style="list-style-type: none">▪ Responsible for the maintenance of the land infrastructure including associated structures in accordance with the associated regulatory directives and recommended good practices.▪ Responsible for the environmental protection in accordance with the associated regulatory directives and recommended good practices.
Medical and Welfare Staff	<ul style="list-style-type: none">▪ Responsible for the first response medical and accident cover during activities involving people and invited members of the public by the Downs Malvern College Preparatory.▪ Responsible for the provision of suitable protective equipment as outlined in the recommended guidance for children from the Downs Malvern College Preparatory taking part on the DLR.▪ Responsible for direct welfare supervision and discipline of children from the Downs Malvern College Preparatory.
School Pupils (Children)	<ul style="list-style-type: none">▪ Responsible for the safety of themselves and others when suitably experienced and qualified.

Table 2 - Area of responsibility

Appendix B – Example Risk Register

Serial	Risk Title (Hazard)	Description of Risk	Effect	Likelihood	Severity	Risk Level	Risk Owner	Risk Manager	Management and Mitigation Strategies & Controls to Achieve ALARP State	Likelihood Post Mitigation	Severity Post Mitigation	Risk Level Post Mitigation	Mitigation in place	Top Risk	Last Review Date	Next Review Date	Closure Date and Reference	ALARP	Tolerable
Steam Locomotive Boilers																			
1	GEN-Boiler 1	Risk of structural failure through wear and tear	Explosion resulting in severe injury or loss of life	Possible	Catastrophic	Substantial	DLRT	Managing Trustees	(a) Boilers are built to EC-PED with certificate of conformity. (b) Boilers are internally inspected annually by a certified independent boiler inspector. (c) Boilers are steam tested annually by a certified independent boiler inspector. (d) Boilers are removed from locomotive every ten years for a full inspection. (e) Boilers are operated within certificate validity unless exempt by the certified independent boiler inspector for purposes of testing.	Improbable	Catastrophic	Moderate	Yes	No	Sep-13	Jan-14		Yes	Yes
2	GEN-Boiler 2	Risk of structural failure through incorrect operation (excessive pressure or lack of water).	Structural failure causing explosion resulting in severe injury or loss of life	Occasional	Catastrophic	Intolerable	DLRT	Managing Trustees	(a) Boilers are operated within certificate validity unless exempt by the certified independent boiler inspector for purposes of testing. (b) Boilers are fitted with dual safety valves preventing over pressurisation. (c) Boiler fire box is fitted with a fuseable plug. (d) Boilers are fitted with two water feeds.	Improbable	Catastrophic	Moderate	Yes	No	Sep-13	Jan-14		Yes	Yes
Steam Locomotives General Operation																			
3	Risk of burns	Burns caused from steam or hot surfaces.	Skin burns	Frequent	Medium	Substantial	DLRT	Managing Trustees	(a) Minor burns are accepted as part of the operation of a steam locomotive, and is used to encourage respect and learning. (b) Operators are discouraged from using safety gloves around steam, due to the heightened risk of severe burns. (c) Cold water source exists at Hoyland Down to cool down minor burns. (d) First Aid burn kits are immediately available.	Improbable	Minor	Tolerable	Yes	No	Sep-13	Jan-14		No	Yes

Risk Details

Level with no measures in place

Level with mitigating control measures in place to achieve ALARP status

Review

Appendix C – Example Educational Learning Matrix

Surname	First name	Year	D/S	Locomotives						Railway Operation							Track work						Workshop								Score	Leaving Level					
				Prep-PHy	Drive-PHy	Q1: Qualified-PHy	Prep-Steam	Drive-Steam	Manage-Steam	Q2: Qualified-Steam (S)	Q3: Qualified-Steam (A)	Pointwork operation	Obstacle clearance	Passenger/Goods Safety	Block Token Signalling	Q4: Qualified Guard	Building security	Tumtable operation	Carriage Prep	Line side Safety	Ground working / tool selection	Assembly/Disassembly	Pointwork lubrication	Rail bending	Ballasting - Packing	Ballasting - Levelling	COSHH Safety	Compressed Air Safety	Markup and Measurement	Grinding			Drilling	Cutting (band/hack saw)	Prep and Painting	Design and Production	Fault finding
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Rail Qualification

Q1: Qualified Petrol-Hydraulic
 Q2: Qualified Steam (Standard)
 Q3: Qualified Steam (Advanced)
 Q4: Guard

Locomotive

Blue Neckerchief Tim
 Red Neckerchief James Boyd/Brock
 Red Neckerchief George & Visiting Locomotives
 Badge N/A

Grading

4 Leader
 3 Competent
 2 Supervised
 1 Learner
 0 -

Qualified
 Under qualification assessment
 Developing skill
 Teaching required
 -