26.	Set out your policy for ensuring that subsistence and travel expenses cease when it can be reasonably expected that the '24-month rule' will be broken (applicable only to employees who are not subject to, (or to the right of) supervision, direction or control).			
27.	Explain how you determine whether or not a new employee has previously worked at the same site.			
28.	Detail how you identify the expenses/employees to be audited. If an employee does not conform to the expenses policy, explain how this is dealt with.			
29	Please provide a reconciliation of the total capital and reserves figure on the balance sheet of your latest statutory accounts for either your trading company or ultimate parent company showing a positive net worth of at least 2.5% of your margin (Umbrella Employers and Self-Employed models) and/or fee income (Limited Company Advisors) for the year.			
30	If you employ workers who are not subject to, (or to the right of) supervision, direction or control and as a consequence you reimburse expenses to those employees for their journeys from home to temporary workplaces, please explain the processes that you have in place to review and document whether or not they are subject to, (or to the right of) supervision, direction or control.			

31	A copy of your policies and standard documents evidencing your review of whether an employee is or is not subject to, (or to the right of) supervision, direction or control.			

	Limited Company Advisors			
1.	Please attach a copy of your expenses guidance document			
2,	Please set out how you verify/authorise the potential customer's identity or provide a copy of your policy/procedures. Detail what documents you obtain and checks you carry out to do this.			
3.	Provide the following information as at the end of the last tax year or last financial year:			
4.	The number of your limited company customers.			
5.	Provide a copy of your current fee structure			
6.	The turnover levels of those limited companies for the last year (tax or financial) split as follows: a. £0 to £50,000; b. £50,001 to £100,000 c. £100,001 to £150,000 £150,000 and above			
7.	Please confirm you have systems in place to monitor and address the activities involved in any client HMRC enquiries or compliance contacts. Explain what these systems involve, how problem areas are identified and then addressed.			

	Self-employed model only			
1.	The introduction letter given to the worker confirming that the worker: a. is a Self-Employed worker, is aware of their responsibilities to pay taxes as a self-employed worker and is aware of that they have no Employee/Worker statutory rights; b. Will be subject to a proof of eligibility to work in the UK check; c. Will be required to enter into a Self-Employed contract (please attach a copy); d. Understands and agrees that they have a responsibility to notify the service provider immediately of any changes in their status;			
2.	A copy of a financial illustration that you provide to a potential Self-Employed subcontractor.			
3.	A copy of your policies and standard documents concurring how you review the employment status of all prospective self-employed workers prior to making a second payment to them after initial engagement;			
4.	Details of where the results of these checks are documented Details of how you evidence cases where workers chose the umbrella/PAYE option over self-employment Details of how you record failures of the self-employment review			

6.	Please attach a copy of your; Self-Employment contract (for any revised in the last 12 months, a copy of the current and past contract and the dates of any revisions); and, unless included within the employment contract; a. Assignment/Project schedule; b. EAA opt out notices; c. Data protection agreement			
7.	Please detail how you inform the agency of the worker's EAA regulation status and what procedures you have in place if an employee notifies you that they wish to withdraw an opt out notice.			
8.	Please provide a copy of your latest policies re: a. Professional indemnity; b. Employers liability (held on a contingent basis); and c. Public liability.			
9.	Provide a copy of your communication to workers that you require them to hold their own insurance			
10.	Explain how you ensure that Self Employed workers have the appropriate insurance cover?			

11	Please provide a copy of your standard agencies contract/terms plus a copy of the contractual terms used for your 5 largest agencies if they differ			

	If operating CIS model			
1.	Please provide your UTR and Company Registration Number and status under CIS (e.g. Gross/Net)			
2.	Please provide documentation to support your registration under CIS and your status			
3.	Please attach your process for verifying self-employed workers with HMRC.			
4.	Attach your process for dealing with payments to sub-contractors who work both inside and outside of the CIS rules.			
5.	Describe your process for ascertaining the level of materials to be taken in to consideration when determining the amount to be subject to deduction under CIS			

6.	Attach your process for ensuring that the CIS returns are accurate and submitted on time			
7.	Detail any penalty notices or correspondence issued to you by HMRC within the last 12 months in respect of late/incorrect PAYE/NIC or CIS returns and payments			
8.	Provide details of any on-going disputes with HMRC or recently settled disputes within last 12 months concerning PAYE/NIC, VAT or CIS issues including, but not limited to, your own gross payment status			
10	Please provide a copy of your standard agencies contract/terms			

APPENDIX

Self-employment - HIGH RISK categories of workers

Categories/Sectors

Administrative/Clerical
Assembly plant
Call Centre
Data Entry
Hospitality
Industrial
Light industrial
Mail Centres
Package Handling
Retail
Warehouse
Restaurant / Food Service
Social care
Agricultural
Benefits Assessor/housing/council officer
Document Controllers
Lab Technicians/Biomedical Scientists
Low Skilled/Admin roles
Pharmacy Technician
Previous employment (same job and organisation)
Secretaries/Personal Assistants
Labourers
Non-skilled manual workers

APPENDIX 5

Transport for London Compliance

Appendix 5
Transport for London – Compliance

The following shall apply to actions including recruitment, assessment, hires, compliance and onboarding in relation to Transport for London.

For hires for Transport for London where a reference is outstanding after 20 working days from the date of the offer being accepted, the Service Provider shall, if it is complete and available revert to the result of the Disclosure and Barring Service Basic Disclosure (or Enhanced Disclosure if this is specified) and if it is clear with no convictions, cautions or observations then the referencing process may cease.

Compliance and onboarding requirements for London Underground hires

The following shall apply to all workers engaged to work on assignment to London Underground Limited:

1.1. London Underground hires: Temporary Workers attending any of LU's safety training courses shall not have performed work in the previous 11 hours preceding the start of the course and should be sufficiently alert and awake to derive full benefit from the course.

1.2. London Underground hires: For Temporary Workers on assignment with or for London Underground Limited, the Service Provider will ensure Temporary Workers supplied are competent, having attended and achieved the required standard in agreed courses in accordance with London Underground Limited (LUL) Contract QUENSH Conditions (Quality, Environmental, Safety and Health) as appropriate.

1.3. Onboarding and screening provisions required by Transport for London Confirmed by Sandy Castle LU Access | Capital Programme Directorate, 16.01.19]

1.4. The following points 4.12 to 4.22 apply to certain hires for Transport for London by default or where specifically instructed by a Functional Body

1.5. London Underground hires: Selected London Underground Roles - some roles may require access to London Underground infrastructure and may therefore require Sentinel cards. In order to sponsor individuals who require a Sentinel card the Service Provider, must registered and be Achilles "Link Up" accredited in the appropriate categories or oversee the operation of the system by a subsidiary company or sub contractor. Failure to obtain or loss of this accreditation may result in suspension of any current and new assignments until such time that the accreditation is achieved or regained. Registration and any periodic training and testing costs to maintain individual cards shall met by the Service Provider. Where a medical examination and Drugs and Alcohol certification is required for new cards, the responsibility

for ensuring this is carried out is the sole responsibility of the Service Provider and all costs shall be the responsibility of the Service Provider.

1.6. The Service Provider shall ensure that 'Competency Management' is in place for all Temporary Workers and that it is paid for where required to carry out the role. This includes but is not limited to all certifications listed as essential on the job description and person specification, expected to be in place including Controller of Site Certification (COSS), Protection Master (or equivalent) and all London Underground licences required to work on track and stations and to comply with legislation, the Authority and subsidiary company policies and working practices.

1.7. London Underground hires: Where requested by the Authority, the Service Provider shall provide CVs and Temporary Workers for week work (Monday to Friday) who are briefed and who have agreed to be available to work at weekends and/or nights as required on an ad hoc basis as required when subject to the limits of the working week as defined by the Working Time Regulations as directed under QUENSH'.

1.8. The Service Provider shall ensure that where required for the role, a satisfactory medical examination is carried out and a result provided to the Authority before a Temporary Worker commences assignment and there shall be no exceptions to this requirement. The Service Provider will pay for all such costs. For Temporary Workers on assignment to London Underground, where a medical examination is required, the Service Provider shall comply with LU's medical requirements as set out in LU Standards S1601 'Management arrangements to assure medical fitness' and S1602 'Corporate medical standard for personnel requiring safety on the track certification'. See Appendix 9 and Appendix 10.

1.9. All hires: Where required, a DAMSP (Drugs Alcohol Medical Screening Programme) Certificate shall be in place and carried out by the Service Provider at all times where they are undertaking Safety Critical Activities. The Service Provider should conduct unannounced drugs and alcohol testing of at least 5% of their workforce that undertake Safety Critical Activities per annum.

1.10. All hires: When required by the Authority, the Service Provider's Temporary Workers shall co-operate by providing breath tests or specimens for analysis in the following circumstances:

a) prior to starting the Assignment or an approved training course;
b) annually;
c) unannounced and on a random basis in addition to testing for any other reason;
d) when suspected of an infringement of a legal requirement;
e) following an incident.

1.11. Failure to comply with this requirement (3.17 above) may result in civil or criminal action against the Temporary Worker, the Service Provider or both.

Testing will be undertaken at the Service Provider's expense. Information on laboratories approved by The Authority for alcohol and drugs screening will be available on request. Records of testing shall be produced by the Service Provider on request or at specified intervals. Records of individuals who have failed to meet the Authority's requirements shall be supplied to the Authority on request.

2. Compliance and onboarding requirements for London Rail and London Overground hires any hires for workers working on Network Rail Managed Infrastructure

2.1. London Rail, London Overground hires (working on Network Rail Managed Infrastructure (NRMI): The Service Provider must, at their own cost, supply and ensure that all Temporary Workers carry with them at all times a Sentinel smart card.

2.2. London Rail, London Overground hires (working on the Network Rail Managed Infrastructure (NRMI): The Service Provider must complete the RISQS (Rail Industry Service Qualification Scheme) questionnaire, and agree to be audited over a one and a half day and a half to three day period (depending on the amount of core modules supplied)and will receive a grading and licence to supply contractors to Network Rail who are working on or near the track that require PTS (Personal Track Safety) staff. The Service Provider will ensure the safety of the temporary or contract member of staff that they supply/ the Service Provider shall act as either primary sponsor or sub sponsor and each has specific rules and responsibilities that must be adhered to.

2.3. London Rail (working on the Network Rail Managed Infrastructure (NRMI): The Service Provider shall appoint a Compliance Manager who has the support of administrative staff, Health and Safety advisors and QMS or Quality Management systems advisors who will ensure compliance is checked and monitored

2.4. London Rail (working on the Network Rail Managed Infrastructure (NRMI) roles and responsibilities for sponsorship:

The following requirements are to ensure the safety of the Temporary Worker and the workers around him or her. TfL are committed to avoiding "double shifting", ensuring that no Temporary Worker operates machinery or equipment for which they are not qualified or trained. The Authority should have clear visibility of whom is operating on or off the network, who they are working with, where they are and the times that they are working, at all times.

All Sponsors
The Sponsor is responsible for the following, regardless of whether they are a Primary Sponsor or Sub-Sponsor of the Temporary Worker;

- Providing the Safety Critical Equipment required to enable the Temporary Worker to undertake their competencies trackside and

ensuring that it is fit for purpose, in accordance with the Sentinel Management System
- Maintaining all records associated with any works undertaken by a Temporary Worker on NRMI, as is required by the Sentinel Management System
- Maintaining a minimum contracted insurance level for works undertaken by the Temporary Worker

Primary Sponsor

2.5. The Primary Sponsor shall establish a 'Contract of Sponsorship' with each Temporary Worker they intend to Sponsor.

2.6. The Primary Sponsor shall undertake checks of a Temporary Worker's suitability to work on NRMI prior to engaging in a Contract of Sponsorship.

As part of the Contract of Sponsorship, Primary Sponsors shall provide Temporary Worker under their Contract of Sponsorship with:

f) A valid Sentinel Smart Card
g) An induction briefing which will include as a minimum the rules and responsibilities of the Sentinel Scheme
h) Suitable PPE, so marked as to identify who the Temporary Worker is responsible to when on NRMI, and suitable training to be able to use that protective equipment effectively
i) Regular briefings on changes to standards, Rule Book updates and Sentinel Scheme Rule updates
j) Training and assessment to ensure competence at required intervals
k) Safety Critical Equipment to enable the Individual to undertake their role (jointly with any Sub-sponsor)
l) Personal issue information such as handbooks and relevant information
m) Advice, guidance or instruction on any restrictions based on medication and other medical fitness issues
n) Mentoring support to develop the competence of the Temporary Worker
o) Clear contractual arrangements between the Primary Sponsor and the Temporary Worker, and whether Sub-Sponsors are permitted

2.7. The sponsors accountabilities and responsibilities are as follows:

2.8. Regardless of the employment status of the Temporary Worker, the Primary Sponsor through the Contract of Sponsorship shall fulfil the role of the employer for the purposes of health and safety.

2.9. The Primary Sponsor who enters into the Contract of Sponsorship with an Individual is also responsible for:

- Monitoring and management of the working hours of Temporary Workers under their Contract of Sponsorship. Shifts worked with Sub-Sponsors must be considered in the monitoring of working hours and the management of fatigue

- Agreeing any sub-sponsorship arrangements with the Temporary Worker and granting permission to any Sub-sponsor to use their resources
- Enacting the Local Investigation process where any suspected breach of the Sentinel Scheme Rules becomes apparent
- Collating information from Sub-sponsors to enable conclusion of the Local Investigation
- Maintaining records of Local Investigations and requesting a Formal Review where a Scheme Outcome is recommended following a Local Investigation
- Providing a reason for de-Sponsoring a Temporary Worker
- Conducting a Local Investigation before de-Sponsoring an Individual for any breach of the Sentinel Scheme Rules
- Collating and maintaining all records associated with the Contract of Sponsorship of an Individual as required by the Sentinel Management System (see Section 3)
- Requesting a temporary Suspension or issuing a temporary Take Down of competence pending the conclusion of Local Investigation where appropriate.

Sub-Sponsor

2.10. The Sub-sponsor must request permission to use a Temporary Worker from their Primary Sponsor. The Sub-sponsor must receive confirmation of sub-sponsorship status before resourcing the Temporary Worker to work.

2.11. The Sub-sponsor is responsible for providing all information to the Primary Sponsor to enable the Primary Sponsor to manage the overall safety of the Temporary Worker. This includes, but is not limited to information on working hours, safety incidents, competencies used and short-falls of competence.

2.12. The Sub-sponsor must notify the Primary Sponsor of any alleged breach of the Sentinel Scheme Rules as soon as is reasonably practicable after becoming aware of such allegation, and co-operate in collecting information and evidence to enable the Primary Sponsor to conduct a Local Investigation.

2.13. The Sub-sponsor must co-operate with the Primary Sponsor in the management of working hours. Where a risk assessment has been conducted and extra working hours approved, this information must be provided to the Primary Sponsor.

2.14. Individual Cardholder

The Temporary Worker shall carry their Sentinel Smart Card at all times while working on NRMI and will co-operate with their Primary Sponsor to keep the personal information held in the Sentinel Scheme Database and printed on the Sentinel Smart Card up to date.

2.15. The Temporary Worker shall follow the rules of personal accountability for working safely on NRMI, including compliance with the Lifesaving Rules.

2.16. The Temporary Worker has a responsibility to manage their Sponsor relationships and at all times when working on the NRMI an Individual has a responsibility to:

- Know the identity of their Primary Sponsor
- Know which Sub-Sponsor they are working for (when they are not working for their Primary Sponsor)
- Provide the correct name of the Sponsor they are working for when booking into site

Individuals are required to notify the Primary Sponsor if they no longer wish to be sponsored by them so that they can be de-sponsored. Change of sponsorship can be requested online through My Sentinel. Individuals can access their personal records on the Sentinel Scheme Database. This can be requested from their Primary Sponsor, or by direct access to the My Sentinel area of the Sentinel website.

As mentioned above, in order to supply, the supplier must have certain organisational structures in place to ensure that they are compliant with the above;

Competence Management System

2.17. The Sponsor shall have a competence management system in place to flag the training and assessment interventions and for undertaking mentoring required for Temporary Workers for whom they are the Primary Sponsor, in advance of their expiry. The Sponsor shall then arrange training, assessment and mentoring to take place in advance of expiry, where the competence is still required.

Management of Working Hours

2.18. Primary Sponsors shall have a Fatigue Risk Management System in place for Temporary Workers they have entered in to a Contract of Sponsorship with.

2.19. The Sentinel Scheme Database will provide data on when cards are authenticated for each Individual under their contract of sponsorship, whether on behalf of the Primary Sponsor, or the associated Sub-sponsor.

2.20. The Primary Sponsor shall use the data from Sentinel as part of their Fatigue Risk Management System.

2.21. Sub-sponsors shall notify the Primary Sponsor of any approved excessive working hours, along with the associated risk assessment to enable the Primary Sponsor to manage any fatigue risk associated with the Temporary Worker.

2.22. The Primary Sponsors' Fatigue Risk Management System should proactively predict fatigue and therefore prevent excessive working hours, this is to avoid relying solely on the Sentinel Smart Card to alert exceeding of hours once it has occurred on site.

Provision of PPE and other Personal Issue Equipment

2.23. Primary Sponsors shall have a process in place for the provision of Person Protective Equipment (PPE) and other personal issue equipment to each Individual for which they are the Primary Sponsor, and suitable training to be able to use that protective equipment effectively. PPE must be of a minimum standard to comply with both Network Rail and the Primary Sponsor's PPE Policy.

2.24. This process shall include documenting the provision and routine check of PPE to ensure it is maintained and fit for purpose. The process shall also provide details for the provision of additional or replacement equipment when lost or damaged.

2.25. Sub-sponsors must provide further PPE as required by any task based risk assessment they conduct.

London Underground Safety Certificate and Safety Authorisation

June 2018

UNDERGROUND

EVERY JOURNEY MATTERS

Table of Contents

Duty Holder

The Duty Holder of this Safety Certification/Safety Authorisation is:

London Underground Limited
Windsor House
42-50 Victoria Street
London
SW1H 0TL
Telephone: 0207 222 5600
Facsimile: 0207 222 5083

All queries and correspondence regarding this document should be sent to:

Head of HSE London Underground
London Underground
Floor 7 7B2
Palestra
197 Blackfriars Road
London
SE1 8NJ

This application for non-mainline Safety Certification and Safety Authorisation was approved by the Office of Rail & Road (ORR) in June 2018.

This document will be made available to the public on the Transport for London website (www.tfl.gov.uk).

To the extent permitted by law, no liability is accepted by London Underground Limited or any of its associated companies (present and future) for any loss or damage arising from the use of this document for any other purpose.

Revision Control

London Underground (LU) has maintained an approved Railway Safety Case since 1995 in accordance with the Railways (Safety Case) Regulations. Following the introduction of the Railways and Other Guided Transport Systems (Safety) Regulations in April 2006, LU's application for Safety Certification and Authorisation was approved by the Office of Rail Regulation (now known as the Office of Rail and Road) in March 2007. A subsequent renewal was approved in March 2011. The Safety Certification relates to train operations and the Safety Authorisation covers stations and infrastructure operation including the operation of engineering trains.

Revision Number	Date	Changes
Version 5	January 2017	Minor updates of LU's Safety Certificate and Safety Authorisation for formal re-submission to the Office of Rail and Road (ORR).
Version 5.1	May 2017	Minor changes resulting from organisational change - removal of the role of Chief Operating Officer
Version 5.2	November 2017	Organisational changes resulting from Transformation
Version 5.3	June 2018	Incorporate TransPlant Safety Certificate following re-organisation

Section 1: Type, extent and particulars of operations and infrastructure

Contents

1.1 Introduction

London Underground (LU) is the metro system which serves London and surrounding counties. LU provides a non-mainline mass transit train and station service seven days a week and is an integral part of the transport system in London.

This Safety Certificate and Safety Authorisation document describes how LU manages its activities to deliver a safe railway. Safety performance has continuously improved over the past 15 years and LU's investment programme will further deliver safety and reliability benefits through the delivery of new rolling stock, upgrading of track, new signalling systems and upgraded stations.

This section provides a summary of the particulars of LU's operations, infrastructure and assets. The locations served and LU's boundaries of operations are shown on the map in Annex 1A.

1.2 Ownership

LU is a wholly owned subsidiary of Transport for London (TfL), the statutory body responsible for implementing a transport strategy for London, carrying out the Greater London Authority's transport duty and following the directions of the Mayor of London. The London Underground Board governs London Underground and the London Underground Managing Director reports` directly to the TfL Commissioner. Details of governance, and the organisation and roles and responsibilities that enable the safe operation of the LU network are described in Section 2.

Following the integration of both Tube Lines Limited and Powerlink operations into TfL in recent years, a programme of work is underway to integrate management system content, identifying any gaps, capturing best practice and aligning processes.

TransPlant is a department within London Underground that operates and maintains a fleet of engineer's trains and on track plant.

Other duty holders within TfL responsible for their own Safety Authorisation and/or Safety Certificates are:

- Rail for London Limited (Safety Authorisation); concessionaire, Arriva Rail London (Safety Certificate and Safety Authorisation);
- MTR Corporation (Crossrail) Limited (Safety Certificate and Safety Authorisation)
- Docklands Light Railway Limited (Safety Authorisation); franchisee, Keolis Amey Docklands Limited (Safety Certificate and Safety Authorisation).

London Trams, which are part of the TfL organisation, also have responsibilities under the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS).

1.3 Employees

LU employs approximately 20,000 staff and operates in a hierarchical, functionally based structure. Within LU, a number of staff undertake safety critical activities. These activities are further detailed in Section 17.

The number of contractors employed by LU varies depending on the nature of project and maintenance work and can range from 5,000 to 20,000. This includes contractors employed at LU locations as well as those who work off-site (in or outside London).

1.4 Interfaces with other railway operators and infrastructure managers

LU lines comprise approximately 860 track kilometres linking 270 stations, 262 of which LU operates. The remaining eight stations are operated by Network Rail or other Infrastructure Managers. Several LU stations interface with other railway operators. LU operates on Network Rail infrastructure at a number of locations. Details of LU's interfaces with Network Rail and other operating companies and how these are managed to ensure co-operation between the parties are described in Section 13.

1.5 Signalling and control systems

The signalling system embodies significant safety redundancy in its design and implementation and is not reliant on the safety integrity of a single component. Signalling control systems on the Underground are organised to facilitate safe control of the railway on a line by line basis from line control centres. The underlying technology varies from line to line. Signalling assets are described in more detail in Section 16.

1.6 Infrastructure affecting safe operation

LU is the Infrastructure Manager for the LU network and as such is responsible for health and safety, the control of infrastructure and the operation of stations. The fundamental characteristics of the LU network have a major impact on the design and maintenance of assets, especially in the context of rising customer numbers:

- two different sizes of tunnel and train - tube and sub-surface
- curvature of the tracks restricting speed
- the space constraints of tube stock
- congestion due to the layout of many old stations
- the variety and age of assets used.

Health, safety and environment management arrangements are described in Section 2. The design, maintenance and operational arrangements are detailed in Sections 14, 15 and 16 respectively.

1.6.1 Track

A number of different track constructions are employed, using wood or concrete sleepers or concrete slabs. In open and sub-surface tunnels sleepers are laid on stone ballast. In tube tunnels, sleepers are fixed in place by concrete. Where assets are being upgraded, LU's strategy, where possible, is to replace bull headed rail with flat bottomed rail on concrete/modern form sleepers. Track geometry and the track environment, e.g. on a bridge, embankment, etc., influence the track construction.

The Category 1 Standard: *S1157 Track – Performance, design and configuration* outlines the issues to be considered during track design, including the normal track loading generated by speed and tonnage of both service vehicles and engineer's vehicles using any particular route. All tracks are designed and maintained so that track condition, geometry and track bed condition are preserved.

In total, the LU network extends over approximately 860km of running track, of which approximately 17km is single track. LU also has rights to operate over 17km of Network Rail track. Aldwych is not considered part of the operational railway as it is not used on a regular basis. King's Cross and Euston Loop are used on a regular basis by engineers' trains and can be used for reversing empty passenger trains.

The LU network is over 150 years old and there are a number of complex rail junctions across the network. Safe operation of the passenger railway over these junctions and across the railway is managed as set out in Section 16.1.

There is only one public crossing of the track on the LU network, north of Amersham station, which is controlled with:

- reflective whistle boards positioned 200 metres and 400 metres on the approach side of the crossing in both directions
- warning signs to the public
- non-slip material covering the wooden walking area of the crossing.

1.6.2 Tunnels

Tunnels are subject to design and maintenance standards to limit the risk of failure. Surface stock is prevented from entering tube tunnels by surface stock detectors where necessary. These turn all signals to danger and raise trainstops. Nine pairs of Tube tunnels pass under the River Thames.

In the usual course of operations, the piston effect of trains moving through tunnels provides the majority of ventilation on the Underground. This is supplemented by tunnel vent shafts and fans on some lines.

Between Westminster station and the Canning Town portal on the Jubilee line, ventilation fans can be used to control smoke and direct air flows in an emergency as part of an integrated tunnel and public area ventilation system.

In each of the two tunnels between the Green Park junction and the Canning Town portal on the Jubilee line, there is a continuous walkway for use by the emergency services.

1.6.3 Pumps and floodgate

There are 2 operational floodgates located at Canning Town portal (that prevents flooding from the River Lea) and at Westminster on the Jubilee line (that prevents flooding from the River Thames). There are approximately 2,000 sumps and 720 pump sites on the LU network. Of these, 65 pump sites are at critical locations and there are over 270 sites that are monitored and controlled remotely.

1.6.4 Station assets

Stations are categorised as open, sub-surface or tube. This categorisation depends on the extent to which the station is underground. Most sub-surface and all Tube stations are fitted with additional fire prevention features and have two independent sources of power.

Customer flow in LU stations is managed through a combination of a gateline (in the majority of stations), structural design of station premises, fixed and temporary barriers, lattice gates and staff operational procedures. Station lighting is designed and maintained to provide appropriate lighting levels within the station environment. Stations have back up emergency lighting systems (where appropriate) in the event of a power failure.

LU has a number of disused stations, where a train service is no longer operated. Management responsibilities are defined for these stations and these managers are responsible for ensuring that regular inspections are undertaken to ensure that these locations pose no risk to the operational railway.

1.7 Train operations

Customers make over 1.3 billion journeys on the LU network each year.

Traffic hours are from approximately 05:00 until approximately 01:30 for the majority of LU lines. LU operates a 24 hour service on Friday and Saturday nights on the Central, Jubilee, Northern, Piccadilly and Victoria lines. The number of train movements varies across the network, and is approximately 540 trains on a weekday peak, 465 trains on Saturday peak and 430 on a Sunday peak. The LU Working Timetables, which show all train movements on the Tube network including empty trains and train movements in and out of depots, are available on the TfL web site.

LU operates a fleet of passenger rolling stock which is described in Section 18. LU also operates a fleet of specialist of engineering vehicles (described in Sections 16.1.1 and 18.) and TransPlant maintains and operates engineering vehicles on the LU network in line with its Safety Certificate.

1.8 Engineering vehicles

London Underground, through an internal department called TransPlant, operates a non-passenger fleet of engineers' trains used to transport engineering materials, plant and equipment in support of the maintenance, improvement, renewal and enhancements on LU. The fleet consists of approximately 230 vehicles, which is made up of electric battery and diesel locomotives and their associated wagons, and other specialist "on-track machines" such as tamping machines, rail mounted cranes, a weed control train, vacuum machines (DISAB) and a track recording vehicle.

Each week approximately 70 train and plant operating shifts take place to support week night and weekend engineering work. These operating shifts comprise outward and return journeys to and from the worksite. When supporting weekend closures of the railway, a number of train movements may be made between the worksite and the supply depot. Some stock movements take place between our depots for train preparation or maintenance purposes during the traffic day, but outside of the morning or evening peak periods.

The TransPlant fleet of engineers' trains operates over the entire London Underground Network which includes some infrastructure owned and managed by Network Rail. Permitted running routes and paths for Engineers Trains are documented in the LU document, 'Permitted Running Routes for Engineers Trains and Heritage Trains'

Annex 1A: LU Operations Map

The map below shows the full extent of LU operations

Section 2: Safety Management System overview

Contents

2.1 Introduction

LU's Health, Safety and Environmental Management System (HSEMS) provides the structure and framework within which health, safety and environmental risks are managed. The key objectives of the HSEMS are to:

- set out the strategic management arrangements and processes by which the commitments within the Health, Safety and Environmental Policy are met
- allow management of risks to a level that is 'as low as reasonably practicable' (ALARP).

LU's management arrangements are consistent with good practice and the principles in the Health and Safety Executive guidance contained in HSG 65, Managing for Health and Safety and OHSAS 18001 Occupational Health and Safety Management Systems specification.

2.2 HSE Policy

The London Underground Health, Safety and Environment (HSE) Policy (P002) sets out LU's overall health, safety and environmental aims, gives a commitment to improving health, safety and environmental performance and directs management arrangements and responsibilities. It is authorised by the LU Managing Director and sets out the principles of action for the organisation.

The policy has been communicated to all LU employees via the corporate email communication bulletin, the LU intranet, noticeboards and team briefings, and all LU Directors have a responsibility to ensure staff awareness and compliance. The commitments set out in the policy are articulated through specific requirements in the Management System. The Health, Safety and Environment Policy is reproduced in Annex 2A.

2.3 LU Management System framework

The Management System incorporates various elements relevant to the management of safety within LU. The structure of content within the Management System and how the content should be used is described in Reference Document: *R0010 Framework for the TfL Management System content*.

Access to the intranet-based Management System is available to all LU staff, and to suppliers on request.

Where other operating companies (TOCs) use LU's infrastructure or LU operates on other TOCs' infrastructure, appropriate agreements are put in place to allow the TOCs access to the relevant parts of the Management System, as described in Section 13.

Details of management responsibilities for updating the management system and the change control process are included in Sections 5 and 7.

2.3.1 Key elements of the Management System

The Management System is made up of the following key elements:

- Clear instructions and guidance including on-line handbooks, standards, and guidance that enable LU staff to carry out their activities safely
- Associated training for LU staff and managers
- Suitable metrics on business and safety performance where applicable and useful

- Performance management of LU employees to ensure the correct safety behaviours are being adopted
- Audit of requirements in the system, to ensure that safety procedures and standards are being met
- A flexible change control mechanism to use when parts of the system need to be expanded or changed, e.g. as a result of new safety developments (as outlined in Section 9.2 or as a result of lessons learnt from an incident (as outlined in Section 10.1.2)

These elements are aligned and support each other to create an integrated safety management system.

Figure 2.1 The Management System Documentation

LU is not a member of the Railway Group, but complies with relevant Railway Group Standards (RGS) where it operates over Network Rail infrastructure. Agreements are made with Network Rail about application of the relevant Railway Group or LU requirements as set out in Section 13.

2.4 Governance

The London Underground Board governs London Underground and is accountable for making strategic decisions which govern LU and for managing risks significant to LU's business objectives. The London Underground Executive meeting (which is attended by the LU Directors) reviews safety performance and key safety risks regularly.

The London Underground Board has granted decision making powers to a number of executive groups to assist in ensuring that the collective accountabilities of the LU Directors are discharged within a clear management framework. The Director's Risk and Assurance Change Control Team (DRACCT) focuses on managing safety risks associated with changes.

2.4.1 LU Directors' Risk, Assurance and Change Control Team

The LU Directors' Risk, Assurance and Change Control Team (DRACCT) undertakes an important peer review role within LU under delegation by London Underground

Executive. The group meets at least every four weeks and may meet more frequently if needed. Its core role is the peer review:

- of changes with the potential for significant safety impact (including those changes initiated by LU Programme Boards)
- of significant HSE changes to processes, technology, operational arrangements, engineering works, organisational change, etc. (as set out in Section 7)
- when Independent Safety Verification is required under the Railways and Other Guided Transport Systems (Safety) Regulations (2006)
- of formal investigations in terms of their adequacy and the outputs in terms of Formal Investigation Reports (FIR) and improvement programmes
- of all Rail Accident and Investigation Board (RAIB)/Office of Rail and Road (ORR) reports concerning LU
- of changes to standards and procedures
- of Operational Safety Plans.

The roles and responsibilities of DRACCT are set out in Category 1 Standard: *S1538 Assurance* and in the DRACCT Terms of Reference.

DRACCT is supported by a Filter Group that deals with less significant changes. Every change agreed by the DRACCT Filter Group is shared and reviewed with DRACCT.

2.5 LU management

The London Underground Managing Director is accountable for the health and safety of Underground customers, employees and others affected by LU operations, and for fulfilling obligations as infrastructure manager for the LU network. All Executive Directors report to the London Underground Managing Director. Collectively, they are responsible for policies, budget approval, strategic planning, proposals affecting corporate goals, safety risks and safety performance.

Each Executive Director is individually accountable for:

- implementing decisions to ensure HSE is effectively managed within their area
- controlling the significant risks associated with activities they are accountable for
- implementing the arrangements for HSE management set out in LU standards
- ensuring implementation and effectiveness of risk control systems.

Directors and senior managers are held accountable for their performance through a variety of means, including:

- delivery of Key Performance Indicators and targets, including safety performance; monitored at local and Board level
- incident monitoring, review and investigation
- compliance with the Management System which is monitored through audits, safety tours, etc.
- through the Performance and Development process described in Section 8.

LU shares corporate safety direction with other parts of TfL (Surface Transport, including London Rail, and TfL's Professional Services directorates) as part of the process of developing TfL corporate safety direction.

Where organisation changes are planned, the safety impacts of these changes are assessed in line with LU's change management processes to ensure risks are identified and appropriate mitigation put in place where required.

The LU organisation structure is set out below.

Figure 2.2 LU Organisation

2.5.1 Health, Safety and Environment

The TfL Director of Health, Safety and Environment (HSE), who is an Executive Director of London Underground Limited and reports directly to the London Underground Managing Director, is accountable to the London Underground Managing Director for:

- providing strategic direction and support to LU management on health, safety and environment
- providing competent professional safety support to LU
- the ongoing development, implementation, maintenance and improvement of the health, safety and environmental management system for LU
- the development, maintenance and review of the health and fitness of LU staff and setting standards for suppliers and contractors.

HSE staff retain LU specific knowledge and experience, and are matrixed across LU. In addition, the Head of HSE London Underground has an indirect reporting lines to the relevant LU Directors.

2.5.2 LU Managing Director

The LU Managing Director is accountable for the running of LU, including trains, stations, and service control, and the maintenance and renewal of LU assets. The Directors are responsible for safety for their respective areas.

The LU Managing Director has overall accountability for:

- customer service delivery of train and station operations to meet performance, quality, safety and security, environmental, budgetary and real time information targets
- ensuring the effective and safe management of operational incidents and effective collaboration with emergency services
- ensuring operational readiness for the integration of new assets into customer service as part of the upgrade programme
- identifying, understanding and managing risks to safety and service from relevant assets and improving where reasonably practicable
- maintaining assets to an acceptable standard of safety and reliability on the basis of whole life cost analysis and the analysis of failure trends to identify areas of improvement

- improving asset management using new technology and best practice in accordance with LU change control and relevant legislation
- employing suitably competent, qualified resources to operate and maintain assets, and ensuring the continued competence through training and licensing
- responding to, and dealing with, reported asset faults
- working collaboratively with colleagues across LU to ensure effective sharing of information and good asset maintenance practice.

Specific details about how LU operates a safe railway service is set out through this document.

2.5.3 Major Projects Director

The Major Projects Director is responsible for the delivery of LU's capital programmes, including the safe design and delivery of new infrastructure (either directly or through third parties). The Major Projects Director ensures the delivery of actions through Programme Assurance by suppliers that are essential for the maintenance and the reduction of risk on the LU network.

2.5.4 Engineering Director

The Engineering Director reports to the LU Managing Director and provides competent engineering advice and support across LU. The Engineering Director establishes standards in relation to assets and seeks assurance that assets are designed, constructed, installed and maintained in accordance with those standards. The Engineering Director has overall accountability for LU's safety verification process as detailed in Section 7. The Engineering Director is supported by Heads of Technical Discipline for the relevant engineering disciplines.

As set out in Section 7, the Engineering Director has overall accountability for the safety verification process and is designated as LU's Independent Competent Person (ICP) under ROGS. Where safety verification activity is required, the independence of the Engineering Director, and/or any resource appointed to undertake safety verification, is achieved by recognition of the functional reporting line to the TfL Director of Health, Safety & Environment (or a person appointed by the TfL Director of HSE).

2.5.5 Human Resources

Human Resources (HR) plays a key role in establishing competence criteria for staff and establishing appropriate performance management arrangements. The Human Resources Directorate, which is part for TfL Professional Services but provides support and HR direction for LU, also monitors the drugs and alcohol testing programmes.

2.6 Consultation with employees

The consultation process provides an important feedback channel between employees and managers on health, safety and welfare matters enabling:

- managers and employees to understand their legal responsibilities
- constructive liaison and feedback between managers and Trade Union Health and Safety (H&S) Representatives
- the improvement of risk control systems.

LU recognises that the success of arrangements for consulting with employees on health and safety matters has the potential to provide significant benefit to HSE management arrangements. Such potential benefits include:

- managers receiving a 'front line' viewpoint before implementing changes,
- Trade Union Health and Safety Representatives made aware of forthcoming issues in sufficient time to enable them to obtain the view of employees they represent,
- better relationships are formed between managers and Trade Union Health and Safety Representatives, and
- enhancing the potential for continuous improvement in health and safety performance.

Staff are encouraged to make observations on local or wider health and safety issues to their managers.

Health and Safety Representatives are elected to represent all staff (regardless of whether they are a Trade Union member or not) on health and safety matters and to communicate and consult with the members they represent.

The intranet-based Management System content: *Communicating and consulting on HS&E* and the suite of HSEMS standards, developed in conjunction with employee Health and Safety Representatives, set requirements for employee involvement in key health and safety related activities. These include:

- the management of change
- risk assessment
- incident investigation
- monitoring and audit
- the development of applications for Safety Certification and Safety Authorisation.

2.6.1 Health and safety consultative framework

In addition to the involvement of LU's Health and Safety Representatives in these day-to-day consultation activities, LU, working with the Trades Unions, has established a consultation framework (*London Underground Health & Safety Machinery* document) that operates on a two level tier basis to enable regular consultation to take place at local, functional and company levels. This has been structured in such a way as to allow health and safety issues and concerns to be considered in the most appropriate way. Full details of the framework are available on the LU intranet.

2.7 Monitoring health, safety and environmental performance

The Category 1 Standard: *S1566 Monitoring Health, Safety and Environmental Performance* applies to LU and its suppliers, and sets requirements for a risk based monitoring framework whereby performance analysis provides assurance that the HSEMS is adequate and effective. The principal means by which LU monitors performance, including addressing shortcomings or poor performance, are set out in the standard. It also gives competence requirements for those carrying out the work and determines priorities for developing improvement actions.

Measuring performance occurs at all levels of management control from Board reviews of performance against safety objectives to operational management monitoring of specific workplace precautions.

Further details on safety performance targets and improvement actions are detailed in Section 6. Further details on incident reporting, investigation and learning lessons from incidents are set out in Section 10.

The intranet-based Management System section on *Reviewing HS&E Arrangements* sets out requirements for the review of the health, safety and environmental aspects of the Management System to ensure its continuing suitability, adequacy and effectiveness. These arrangements allow decisions about the nature and timing of necessary actions to remedy deficiencies and effect improvements. They also ensure effective review of compliance with the health, safety and environmental management system.

2.7.1 Confidential Reporting

LU subscribes to the Confidential Incident Reporting and Analysis System (CIRAS), which is an external service provided for the rail industry. This allows employees to raise concerns in strict confidence. Managers must ensure that all employees are aware of CIRAS. On receipt of reports from the confidential reporting agency, LU investigates the issue, provides a response and takes action as necessary.

Annex 2A: LU Health, Safety and Environment Policy

TfL Health, Safety and Environment Policy

December 2016

My commitment

Our customers, users, employees and suppliers have an expectation that when using or delivering our services or assets they will remain harm free. Our vision is "Everyone home safe and healthy every day". My Directors and I are committed to meeting our vision and these expectations.

We want to ensure that:

- every journey is a safe journey for our customers and users
- the security of our customers and employees is assured
- our employees, agency staff and contractors go home safe and healthy every day
- we maintain our assets and deliver projects safely
- we fulfil our commitments to prevent pollution and nuisance; protect biodiversity; improve air quality; and reduce waste and carbon emissions
- we are inclusive and accessible to all customers and users, including those with disabilities.

How we go about this

We have put in place health, safety and environment rules and procedures, including emergency procedures that are regularly updated. These are for you to use. If you do not know where to find them ask your line manager or your Health, Safety and Environment (HSE) manager.

We assess risks and introduce HSE measures to ensure risks remain as low as reasonably practicable. We tell you the risks and the measures we have taken to control risks. We will comply with legislation. There is regular review of safety, health and environment statistics to identify positive and adverse trends and their root causes, so necessary action can be taken. We also assure ourselves that our suppliers maintain a good health, safety and environment record.

Each year we develop detailed HSE improvement plans to enhance what we do. These plans are regularly reviewed by the Directors in your part of the business.

When working for TfL or one of its companies you will receive the necessary training and equipment to ensure that you can undertake your job safely, ensure the safety of customers and protection of the environment.

As an employee, your physical and mental health and wellbeing is also important and we provide occupational health services to help you stay healthy and in work and provide suitable welfare facilities at your work place.

We want to maintain a fair culture and employees or their representatives are consulted on health and safety matters as they arise, in a meaningful way through scheduled health and safety meetings or more regularly where needed.

What we can all do

We all need to look out for each other and speak up if anything is unsafe or damaging to health or the environment.

We all have a duty to follow our HSE rules and procedures. Do not take shortcuts. If you think rules or procedures are unhelpful let your manager know. Where necessary rules and procedures can be changed.

We can learn from the past, so always report accidents, incidents and near misses/close calls.

Demonstrate the TfL behaviours in everything we do.

In this way we can work together so that our vision for a safe and healthy environment is achieved.

Mike Brown MVO
Commissioner

Leon Daniels
Managing Director
Surface Transport

Mark Wild
Managing Director
London Underground
and TfL Rail

EVERY JOURNEY MATTERS

Section 3: Legislative requirements

Contents

3.1 Introduction

London Underground is aware of its statutory responsibilities as a Transport Undertaking and Infrastructure Manager for the railway. The requirements specified in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS) have been incorporated into London Underground's safety management arrangements.

3.2 Management of legislative requirements

The HSE Directorate maintains a Statutory Instruments Register – a register of all applicable health, safety, environmental and asset-related legislation on behalf of LU as set out on the intranet-based Management System section: *Change to HS&E law*. This requires the HSE directorate to maintain the Statutory Instruments register, to monitor changes to HSE legislation and to identify and address the implications of new or changed legislation. The Register contains two broad headings, Acts and Regulations, these cover statutory provisions in respect of health and safety, environment and assets.

A wide range of legislation applies to LU, including the Health and Safety at Work etc. Act 1974, Management of Health and Safety at Work Regulations 1999, Construction (Design and Management) Regulations 2015, Railways and Other Guided Transport Systems (Safety) Regulations 2006, etc. The Register provides a synopsis of the general requirements of these, and other Acts and Regulations, a commentary on the relevance to LU and a designation in respect of whether the legislation has health and safety, environmental or asset implications. The Statutory Instruments Register is available to all employees through the LU intranet.

Relevant legislation is reviewed to understand how it applies to LU activities. Where required, information, instruction or guidance is added to the LU HSE Management System which will ensure that clear requirements are in place to ensure compliance with legislation (changes are made in line with LU's HSE Management System procedures for managing change outlined in Section 7). Where appropriate, LU's Management System specifically refers to external guidance setting out compliance, e.g. guidance from the Health & Safety Executive.

3.3 Ensuring legal compliance

LU subscribes to a recognised technical index which employees can access via the LU intranet site. To prepare for forthcoming legislation, a nominated manager within HSE regularly monitors a number of key web sites for consultation documents/new legislation. LU participates in the shaping of legislation by analysing the implications of proposed legislation and ensuring that any specific concerns are fed back to those proposing the legislation. This analysis is also presented to key decision makers within LU who ensure that suitable programmes are put in place to ensure compliance in the required timescale.

LU also submits comments on amendments to Railway Group Standards to the Railway Safety and Standards Board (RSSB). Where the need for derogation is identified, this is requested from RSSB in accordance with Railway Group Standards GA/RT6004 Temporary Non-Compliance with Railway Group Standards and GA/RT6006 Derogations from Railway Group Standards. The process is set out in the LU Category 5 Standard: *S5631 Railway Group Standards Reconciliation*. The purpose of the Standard is to set the requirements for the management of Railway Group Standards to

ensure that LU complies with applicable standards and regularise non-compliances where they occur.

Relevant asset engineers and a dedicated role in the HSE directorate are required, through the Manager's Handbook: *H-027 Providing legal support, governance and audit*, to review and provide updates on relevant legislation to the HSE senior team. Where required, changes to documents in the Management System are made to ensure compliance. New or amended documents are developed via the change control process.

Compliance with the legal requirements and applicable Railway Group Standards, through LU's Management System, is ensured through local HSE monitoring, safety and technical assurance processes, verification and audit. This is supported by relevant training and competence management.

Section 4: Control of all categories of risk and risks arising from activities by other persons

Contents

4.1 Introduction

System risk is the totality of all safety risks to customers, employees, suppliers, other railway operators and other affected parties that arise due to LU operations. It comprises:

- risks arising from LU's actions or failures
- risks imported by customers and other third parties
- risks that LU exports to others.

The approach LU adopts to justifying safety decisions such that its risks are ALARP is outlined in the Category 1 Standard: *S1521 Safety Decision Making*. The purpose of this standard is to specify the requirements to ensure that safety decisions are made in a consistent and transparent manner and demonstrate that safety risks have been reduced to a level which is as low as reasonably practicable (ALARP). This standard specifies that the starting position of any ALARP decision is one of best practice and/or modern standards. Where best practice is unachievable, LU undertakes a qualitative analysis of the safety implications supported by a quantitative analysis as appropriate.

Mapping and recording hazards and controls as part of the risk assessment process provides a structured framework for:

- understanding the nature of the current risk on the LU network
- identifying areas needing in-depth risk analysis
- assessing the suitability of risk control arrangements
- assessing the safety significance of proposed changes to the railway
- helping to determine safety objectives, targets and measures.

4.2 Risk identification and assessment

LU and its suppliers are responsible for undertaking risk assessments for their activities that affect the railway in accordance with the Category 1 Standard: *S1526 The Assessment and Management of Health, Safety and Environmental Risk*. The purpose of this Standard is to specify the requirement to (a) identify, assess and manage health and safety risks (associated with activities and operations) to ensure they are reduced to as low as is reasonably practicable (ALARP), (b) Identify and assess environmental impacts to ensure that the principles associated with best available technique (BAT) are applied and (c) Maintain, develop and use the LU Quantified Risk Assessment (QRA) which communicates understanding of the risk from major hazards with the potential to cause fatality to LU customers and other members of the public and assists in managing those risks. The standard includes a requirement to consult and co-operate with other organisations that may be affected.

New risks are identified through considering a range of issues (depending on the activity). The Category 1 Standard: *S1526 The Assessment and Management of Health, Safety and Environmental Risk* sets out approaches for identifying and assessing risk. Methods of identifying risk includes accident and incident records, input from those knowledgeable with the activity (including Health and Safety representatives, engineers, HSE professionals, operational staff, third parties, etc. where appropriate), structured hazard identification (HAZID) sessions, legislative requirements (as set out below), etc. Similar methods are used, when appropriate, for reviewing existing risk assessments. The standard also requires LU and its suppliers to identify and assess the health and safety risks of all changes, activities or projects at the design, implementation, operational and decommissioning stages. This process also applies to assessing the risks to LU from third party activities.

Different situations require different risk assessment techniques. To reflect this, LU has developed a variety of risk assessment tools, these are:

- LU Quantified Risk Assessment (LU QRA)
- Customer Risk Assessment (CRA)
- Workplace Risk Assessment (WRA)
- Asset Based Risk Assessment (ABRA).

The LU Safety Risk Manager provides guidance to LU on the appropriate technique for assessing and quantifying different risks. Risk rating systems have been developed for these risk assessment methodologies.

Particular requirements have been specified in health and safety legislation for certain issues, e.g. noise. These risks are assessed using LU standards and instructions on the intranet-based Management System and UK Health and Safety Executive (HSE) / Office of Rail and Road (ORR) Guidance and Codes of Practice to ensure that best practice is employed.

4.2.1 Interfaces with other railway operators

LU has conducted risk assessments to identify the risks arising due to interfaces when:

- LU operates over Network Rail infrastructure
- LU services interface with other operators' stations
- other operators run over LU infrastructure
- LU trains run parallel to Network Rail infrastructure
- LU stations interface with other operators' services.

These assessments were carried out by operational and safety specialists from LU with support from NR, train operating companies and station operating companies where appropriate.

The findings of these assessments are, where applicable, integrated into the LU QRA. Risk reduction measures arising from these assessments are developed in liaison with those LU interfaces, via appropriate Interface Managers. LU also attends various specialist topic groups with railway industry bodies, e.g. RSSB, to discuss various risk reduction measures.

4.2.2 Interfaces with third parties

TfL Engineering contains a dedicated Infrastructure Protection Team that deals with the engineering interfaces with neighbours. This team acts on behalf of LU where:

- clarity is needed regarding responsibility for assets
- there is a risk to LU assets or operations
- designs and method statements need to be reviewed
- there is a requirement for technical judgement or detailed knowledge of assets
- access needs to be arranged and work needs to be supervised.

Works that interface with third parties are managed in accordance with the Category 1 Standard: *S1023 Infrastructure Protection*. The purpose of this Standard is to define how LU deal with Outside Parties to avoid disruption to LU operations or damage to LU assets when undertaking or proposing to undertake works on, over, under or adjacent to LU assets. Outside Parties are individuals, developers, contractors, etc. who are not procured by LU or their suppliers. The Standard also covers the requirement for LU to consider external risks.

Risks to the safe running of the railway and safety of LU staff and customers which are associated with the activities of other persons on LU's property, e.g. visiting contractors, are managed through the access process. Category 1 Standard: *S1526 The Assessment and Management of Health, Safety and Environmental Risk* requires that LU and suppliers assess the health, safety and environmental risks and assess the impacts arising from their own and third party activities, in normal, abnormal and emergency conditions.

4.2.3 LU Quantified Risk Assessment models

Quantitative risk assessment methodology is used to assess the risk of major hazards with the potential to cause fatality to customers and other members of the public.

The LU QRA determines the expected aggregate statistical fatalities per year resulting from LU operations. This is achieved by evaluating the risk of fatality to LU customers and other members of the public from major hazards on each LU line separately. It then sums these to determine the total risk arising from LU operations. The major hazards are grouped into those that result in similar outcomes. Each of these outcomes is referred to as a 'Top Event'. The risk associated with each Top Event is represented graphically in the QRA risk profile. The QRA risk profile allows LU to easily determine the dominant Top Events.

The LU QRA utilises Fault Tree Analysis to estimate the frequency of a combination of events leading to a major hazard; and Event Tree Analysis to map how events can escalate, including the failure of control and mitigation measures.

LU's suppliers are required to provide qualified and experienced staff to assist with the provision of design, reliability, availability and maintenance data - including information derived from major projects, feasibility or business case studies. LU is responsible for integration of any revision into the LU QRA.

4.2.4 Asset Based Risk Assessments

Asset Based Risk Assessment (ABRA) models each asset class in order to understand and predict potential asset failures together with the safety consequences and likelihood of that failure. Knowing both impact and probability of failure allows LU to review and trend the risk and ensure appropriate mitigations and monitoring is in place. Presently ABRA covers JNP asset areas for all Primary Assets, Civil Assets and Station Systems and is in the process of a roll out to incorporate BCV and SSL assets.

The model is based on the Failure Modes, Effects, and Criticality Analysis (FMECA) approach. Each asset type is assessed for possible failure modes for customers as well as employees. Events data is obtained via an Asset Management Database or through reasoned judgement from experts. A risk assessment is then undertaken on each failure mode based on likelihood, consequences and probability of impact.

To assess the failure mode a simple calculation, based on a number or representative consequences, is used. Each representative consequence describes an event and has a standard severity assigned to it based on the number of probable fatalities or injuries. This is derived from the LU QRA and provides one of several integration points between the two risk models.

4.2.5 Customer and Workplace Risk Assessments

Site-specific customer risk assessments systematically analyse customer routes to identify local hazards and risks to customers. This process identifies lower consequence

hazards (non-fatality risks) not covered in the LU QRA and provides input on location-specific hazards which could affect the risk of fatality. Where the CRA identifies fatality risks or location-specific major hazards, these are put forward for incorporation into the LU QRA.

Workplace Risk Assessments (WRAs) identify hazard groups by analysing the activities carried out in the workplace. Each activity is reviewed to identify the foreseeable hazards associated with it. WRAs also help identify where specific risk assessments are required in relation to specific hazards or activities.

WRAs and CRAs are led by a competent assessor and the process applied ensures the involvement of personnel who are familiar with the location and activities being assessed. Consultation with local Trades Unions Health and Safety Representatives is undertaken in respect of WRA. The CRAs/WRAs include risks arising from the activities of other persons, e.g. malicious behaviour, verbal or physical assault.

To facilitate the capture of assessments and monitoring of compliance with WRA and CRA arrangements, LU requires all assessments to be entered on a central risk assessment database. This database stores all current and archived risk assessments. This approach to customer and workplace risk assessment allows LU to correctly identify and prioritise improvement actions locally and at a network level.

To determine the relative significance of risks, CRA and WRA use a risk rating matrix based on numerical scores for severity and likelihood giving an overall risk rating which enables the significance of each risk to be determined.

High risks are reviewed as a priority to establish tolerability and to ensure immediate action to reduce risks to ALARP is taken. Medium or low risks are reviewed to determine whether there are any further reasonably practicable risk reduction measures that could reduce the risk.

More detail on these types of risk assessment is available on the intranet-based Management System section: *Assessing and managing our HS&E risks*.

4.2.6 Fire risk assessment

While LU's risk assessment framework incorporates some aspects of the assessment of fire risk, LU also sets specific requirements for assessing and managing fire risk – the responsibilities and requirements are set out on the intranet-based Management System.

In line with the Regulatory Reform (Fire Safety) Order 2005, LU is required to demonstrate how compliance is achieved with the risk assessment provisions. The LU approach is based on a number of factors both at a LU network/generic level and an individual station level.

Requirements for maintaining fire compliance documentation are set out in LU's Category 1 Standard: *S1088 Managing Changes to Stations Fire Precautions*. The purpose of this standard is to define LU's requirements for the management of alterations to the general fire precautions on its railway station premises where these changes have the potential to affect the fire safety of stations and the safety of passengers, staff and emergency responders in the event of a fire on a station.

In the event that there is a control failure and a fire occurs, physical control measures are in place to provide detection, suppression, and containment in order to facilitate safe means of escape for customers, staff and contractors. The measures implemented in each part of the station are recorded on the Station Fire Plan.

In the event that changes at the station are required, LU standards require the assessment of the risk arising from the change and the implementation of appropriate control measures (as described in Section 7).

4.3 Control and mitigation of risks

LU has a duty to ensure the risks arising from its operations are ALARP. This requires LU to look for ways to improve safety and to make judgements on whether it is worthwhile to make these improvements. In doing this, LU considers

- the existing level of risk
- the risk reduction that the improvement would give
- the cost and difficulty of making that improvement
- the practicality of the option to achieve the improvement potential (e.g. new build versus refurbishment)
- the possibility of increased accident potential during implementation.

Figure 4.1 outlines the framework applied by LU to assess the tolerability of risk.

Following the assessment of risk, action is taken to control and mitigate risks where required. The action taken will depend on

1. Areas or activities for which risks are not tolerable and ALARP can be identified and programmes developed to address this. LU manages risks in line with the 'Hierarchy of Control': elimination, substitution, use of engineering controls, administrative controls and use of Personal Protective Equipment (in order of preferred priority). The application of the 'reasonably practical'/'ALARP are defined in Figure 4.1 (Category 1 Standard: *S1521 Safety Decision Making*).
2. Where there is a clear regulatory requirement to take action, e.g. Electricity at Work Regulations 1989 or Control of Noise at Work Regulations 2005;

Appropriate inspection, supervision, audit or monitoring is put in place to ensure that controls are applied effectively.

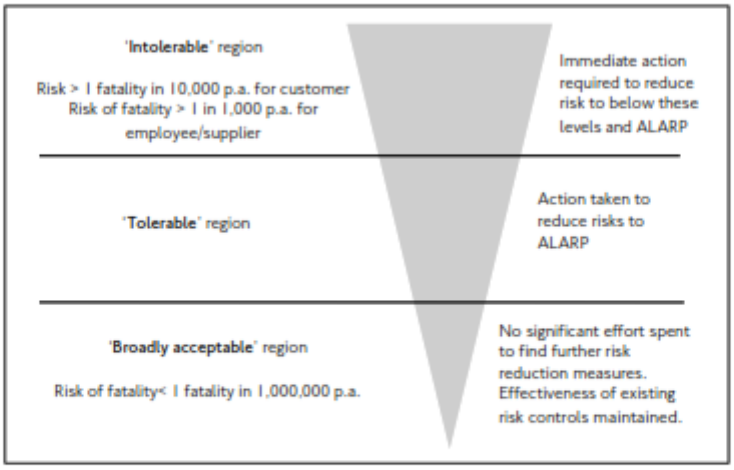

Figure 4.1 Tolerability of Risk (from LU Category 1 Standard: *S1521 Safety Decision Making*)

The ranking of the LU QRA Top Events identifies priority areas. Section 6 provides further details of LU's business planning arrangements. Additionally, the LU QRA is used to inform LU's network safety and technical assurance arrangements, as outlined in Section 14, which monitor the effectiveness of risk controls.

Risk assessment findings are communicated through presentations to the appropriate Director/senior management and local audiences. The LU QRA findings are communicated to LU managers via a report and presentations. The WRA and CRA findings are communicated by local managers to staff via Health and Safety Representatives, notice boards and inductions.

At a network and asset-based level, the findings of risk assessments enable LU to develop a risk based approach to business planning. At a local level, employing managers use relevant risk assessments to develop and implement local action plans with advice from their HSE Manager, to reduce risk within their area of responsibility. The Head of HSE Operations is responsible for ensuring the appropriate responsible managers within LU are identified to implement the corporate actions.

LU's risk assessments and the LU QRA are used to identify pre-cursor events which are then monitored as described in Section 2.

4.4 Controlling risk from maintenance, materials and contractors

Controlling access to infrastructure is a component of LU's statutory duty as infrastructure manager and system risk is controlled by managing:

- who can physically get onto the LU network
- when any other organisation can carry out any work on the LU network
- the extent to which the public can gain access to the LU network.

This is done through:

- clearly defined responsibilities across organisations for planning access and control of work on the LU network
- assessment of the safety risks associated with any work
- restriction of access to competent individuals
- prevention of trespass.

Category 1 Standard: *S1526 The Assessment and Management of Health, Safety and Environmental Risk* requires LU and its suppliers to identify and assess the health and safety risks of all changes, activities or projects at the design, implementation, operational and decommissioning stages. Where required, controls are put in place with appropriate monitoring, inspection or supervision.

The Access Charter and associated Rule Books facilitate a controlled system for reserving and claiming access to the LU network for maintenance and improvement works. It maintains safety risk associated with access to levels that are ALARP by clearly defining interfaces between the various organisations seeking access and mitigating against competitive pressures, in accordance with the Category 1 Standard: *S1538 Assurance*. The purpose of this Standard is to define the requirements for the management and delivery of assurance by both providers and receivers of assurance.

If an individual who is not a member of LU staff wishes to access parts of the LU network from which they would usually be prohibited, they require a Sentinel identification card in accordance with the relevant LU Rule Book concerning access.