LANCASTER & MORECAMBE
MODEL ENGINEERING SOCIETY Ltd

RISK ASSESSMENT

REV 1 SUPPLEMENT 03-2012

ADDENDUM 1F

Updated by committee for the Halloween event to proceed subject to approval of defined additional procedures as requested on the 15 August 2012

Rev	Date	Purpose of Revision	Writer	Approvals
Draft	07.08.12	For Committee Approval	M Sams	
Final	24 09.12	Agreed changes by the committee	M Sams	

Addendum to Rev B issued 26.09.11

1F Nightime Operations

This Section 1F drafted on the 5th August 2012 is an Addendum to the Rev B issue of the LMMES Risk Assessment, the purpose of which is to interrogate the risks and mitigations associated with nightime running involving trains hauling public passengers. On some occasions, such as Halloween, there may be sideshows around the track as entertainment for the passengers.

In comparison to running in daylight hours the following constraints will be applied to nightime operations:

a. Passenger trains utilize only the inner track circuit.

b. There will be no through trains past stations and points will be inhibited to direct all trains through the down station.

c. Train guards will carry a fully charged torch, whistle and flag

d. The guard on each train will carry a hand held radio at all times.

e. The loco will show a leading white light and the guard's truck a rear facing red light (HSG 216 part 100 refers).

f. A maximum of two trains will be permitted on the inner circuit at any one time.

g. Hi-Vis jackets (not string vests) are mandatory for all LMMES members involved in managing and operating trains, with the exception of the train driver where it may encumber safe operation in the confined space of the loco. The vests described should be reflective at night, the string vest type do not conform to this requirement unless they have added reflective bands.

h. The level crossing will be manned on both the entering and leaving roadway directions and the level crossing keepers will carry torches. Level crossing warning lights to traffic will be on continuously. The siren will be disconnected in hours of darkness. This requires a committee decision

i. The OS will have total charge of all traffic movements including instructions to the signal box.

j. Visiting locomotives not permitted without individual assessment by the LMMES Committee.

k. The Cinderbarrow Warden and the local Police Station will be advised that a nightime public running event is to take place.

The content of Rev B of the Risk Assessment is not repeated in this Addendum but remains applicable to nightime operations. Part 2 of Rev B of the Risk Assessment is revisited and expanded to reflect operations in hours of darkness.

Part 2: Annual Operational Risk Assessment – Revisited for Operation in Hours of Darkness

Ranking System is Event Severity to Health x Likelihood = Ranking Value. Likelihood assessment based partially on site incident history.

Ranking of 0 = Risk is Negligible due to Applied Control Action; no action required; but don't be complacent

Ranking of 1 = Risk is Low but monitor the situation

Ranking of 2 = Risk is Medium; consequence should be avoided; take further action to reduce risk.

Ranking of >3 = Risk is High; take immediate action to reduce risk.

TABLE "A" ACCESS AND EGRESS – NIGHTIME [In general terms if there is no red entry in a control box when nightime has no influence]

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
A1	Personnel access to LMMES leased area by unauthorised persons when site is unoccupied by members.	Tripping, falling, and bumping into objects.	1	0	0	Lease area is fenced and gates locked to protect against inadvertent access. Signal posts are removed and stored when site is closed. Stumbling hazards are no different that a rural area. No sharp protuberances. Nightime events are manned and unauthorised access is unlikely.
A2	Personnel access to LMMES leased area when members are present.	Tripping, falling, and bumping into objects.	1	0	0	Members are familiar with the railway paraphernalia of an active miniature railway. Signed in guests are discouraged from wandering on the track and access to the workshop. Vehicle access is gated to prevent inadvertent entry by the public. General Member access area is illuminated at night events.

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
A3	Personnel access to LMMES buildings / facilities when members are present.	Normal access incidents to and within a building.	0	0	0	Members Meeting Room complies with Building Regulations including Disabled Access provisions. Workshop access is restricted by Notice to Members who as members of a miniature engineering society have awareness of the necessary precautions and behaviour in a workshop.
A4	Normal public access to the railway platforms.	Tripping, falling, and bumping into objects. Crowd control.	1	1	1	Properly paved and fully fenced access paths are provided. Public access is only permitted when the platforms are attended by LMMES members and are otherwise locked shut. Queuing for a train ride and exiting a train is carried out in segregated pathways to avoid confusion and crowding. Nightime events for public passenger hauling are restricted to the inner circuit which receives some illumination from the access area lighting and platform area will have additional lighting. The lighting will be sufficient to give safe passage when walking but not intense enough to detract from the atmosphere of the evening In the event of a large public attendance that causes congestion at the entrance/exit gate of the inner platform the leaving passengers will be escorted out through the Member's car park.
A5	Public egress from permitted areas.	Walking directly into moving vehicle traffic.	3	0	0	Exit points from the LMMES fenced area are gated with self closers causing a person to stop before leaving the LMMES area. Night vehicle traffic on the access road should have headlights on making them more apparent to public exiting the platform area. This responsibility lies with the vehicle driver.

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
						See also A4
A6	Access for pedestrians and vehicles to Picnic Area Car Park and LMMES Car Park so crossing the Miniature Railway Tracks during public carrying events.	Collision between a train and a car or a pedestrian.	3	0	0	The level crossing roadway is manned by LMMES controlling traffic at all times that trains are operating. Railway track gates are closed at any time when the level crossing is not manned so preventing locomotives from crossing the roadway. Flashing lights and audible warnings given at the crossing when a train approaches the crossing so warning the public and the LMMES's crossing traffic manager. A Standing instruction/Protocol applies to the correct manning of the crossing. Additional low density illumination of the level crossing area will be provided in addition to the hand held torches carried by the level crossing keepers
A7	Access for pedestrians and vehicles to Picnic Area Car Park and LMMES Car Park so crossing the Miniature Railway Tracks when no public passenger carrying is taking place.	Collision between a train and a car or a pedestrian.	3	0	0	Locomotive drivers give priority to road traffic by halting before attempting to cross the road. A Standing Instruction/Protocol applies to this activity.

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
A8	Pedestrians crossing the track.	Collision between a train and a pedestrian.	3	0	0	The entire track installation is fenced from free public access. A single crossing place is provided for pedestrians at the north easterly curve of the track. This crossing place belongs to the LCC and has gates operated by the public for them to pass through at will and over the track. Warning signs are provided. Locomotive drivers are provided with a whistle marker ahead of the crossing and the track curve is a natural slowing down measure. A small light will be placed to illuminated the W signal
A9	Confined spaces.	Asphyxiation.	3	0	0	The only potential confined space is the carriage shed, however this space is through ventilated by fixed openings from both longitudinal ends and at 4 places in the roof.
A10	Escape routes (1)	Trapped personnel.	3	0	0	The track installation is entirely open air and there are no dead end paths to impeded escape from any particular point in the track or station areas. In the event of passengers being stranded I remote parts of the track circuit the guard will supervise the exit of passengers from the track. Passengers will be instructed when boarding a train on the procedures to be followed at night.

TABLE "B" LIFTING, FALLING, DROPPED OBJECTS [In general terms if there is no red entry in a control box when nightime has no influence]

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
B1	Falling from height.	Injury.	3	0	0	Generally there are no fixed elevated stages. All pedestrian access walking areas above local ground level are fenced.
B2	Dropped objects	Injury	3	0	0	There are no personnel access levels above local ground level and there are no bridges over the track.
B3	Lifting and Overloading.	Bodily strains.	2	0	0	The usual heavy lifts are the locomotives and driving tracks et al and other than these items there are normally no heavy man lifts to be made.
B4	Locomotive handling.	Injury when moving and handling heavy loads from road vehicles and or trailers to the steaming bays and onto the tracks.	2	0	0	The hydraulic lifting table in the steaming bay enables heavy loads to be rolled and not manually lifted when transferring from vehicle road transport to the tracks. A table skirts prevent accidental contact with the lifting mechanism. Attempted overloading of the table trips the hydraulic circuit. A traverser is used to transfer locomotives, driving tracks et al from the hydraulic table to the steaming bay rails and from the rails to the track spurs onto the main track circuits.
B5	Traverser movements	Trip, fall and run over.	2	0	0	The traverser is pulled and not pushed so avoiding the running over of a user. On open days the traverser is operated by LMMES Members.

TABLE "C" COLLISION AND DERAILMENT [In general terms if there is no red entry in a control box when nightime has no influence]

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
C1	Members working on the track for maintenance, repair et al when the track is not operational. Housekeeping, grass cutting etc.	Industrial type injury exposure to worker and those close by.	1	1	0	All track works involve low level activities therefore hardhats are not specified. Members are presumed to carry out activities with which they are familiar and competent and use of tools for which they are familiar or have been trained to use.
C2	Members working on the track for maintenance, repair et al when the track is operational.	Possible impact by a moving train or locomotive.	2	0	0	Hi-Vis jackets are mandatory for anyone within the fenced area of the track circuits. Locos have audible warning means. Track spacing provides a safe ground area providing a means of avoiding a railed vehicle. Work location marked by hazard cones. O.S. monitors track working and has radio communication with signal box.
C3	Train-train collision.	Personal injury. Derailment consequences.	2	0	0	The OS ensures that it is not possible for two locomotives to be on the same track circuit forward facing moving normally in opposite directions so avoiding a high speed collision. Shunting and manoeuvring is carried out under OS control and at very low crawling speeds.
C4	Tail gate collisions.	Personal injury. Derailment consequences.	2	0	0	Signalling is provided to maintain segregation distances and additionally there is line of sight operation. Driving training also enhances safety.

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
C5	Derailment.	Personal injury. Derailment consequences.	2	0	0	Due to the low travelling speed permitted together with low centre of gravity of loaded trucks and locomotives the derailments experienced have only ever caused the wheels to run onto the sleepers. There have been to date no derailments that did not leave the train in an upright position. There have been no personal injuries. There has been to date no damage to locomotives or any secondary events such as unplanned releases of steam or spillage of fuel. The situation is continually observed/monitored. To reduce implications of unforeseen event on the track at nightime the circuit time will not be less than 5 minutes (max of about 3 mph). Wording to be decided by the committee.

TABLE "D" FUEL, EXPLOSION, & CORROSIVE FLUID HAZARDS [In general terms no red entry in a control box = no nightime influence]

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
D1	Volatile Fuels.	Fire/explosion when refuelling petrol, diesel or gas fuelled locomotives and refuelling maintenance machinery such as lawn mowers.	3	1	1	Refuelling is only permitted in the open area rear of the Members building where there are normally no naked flames of other hot surfaces. Fuels are not stored in quantity. The fuel bunker is a separate store remote from occupied buildings and public spaces. The key to the lock of this bunker warns of no smoking on the key tab and the bunker lid is internally labelled the same. The outside of the bunker is not labelled as such due to the possibility of vandalism if the contents are advertised.
D2	Low Volatile Fuels	Burns and uncontrolled fire in Steaming Bays.	1	0	0	Fuels permitted in this area are lumped coal, wood and small quantities of paraffin. Permitted car parking local to the steaming bay can be no closer than 8 feet to the lighting off of locomotives due to the access way and rails of the traverser. There are no open fires in the steaming bay and hot ash is collected in purpose built tray.

D3	Steam Generation.	Scalds and Burns	2	0	0	Boiler steam emission is a controlled event issuing mainly from relief valves and such jets are directed upwards away from persons local to the event. Steam from relief valves condenses in the air close to the point of release and burns are not experienced. Burns from hot surfaces are usually limited to finger ends as the extent of hot surfaces is limited by locomotive size, however members/guests steaming their locomotives are expected to be familiar with their locomotives and so avoid such minor contact burns. Public are not permitted in the steaming bays.
D4	Acids and Alkalis.	Burns	0	0	0	These products are not stored at Cinderbarrow.
D5	Compressed air. Distribution to signalling system.	Signal line failure.	1	0	0	Pneumatic distribution lines and connectors are small bore systems specifically designed for the purpose they are used for. Signal lines in public areas are routed underground in conduits. Signal box relays and distribution is underneath a counter and not in direct line of signal box personnel.
D6	Compressed air. Steaming Bays.	Pressure and flying objects.	1	0	0	The air supply to the steaming bay distribution system is automatically controlled to 30 psig.
D7	Compressed air. Hand tools.	Burst tool casings.	0	0	0	There are no compressed air outlets points for air tools.

TABLE "E" ELECTRICAL HAZARDS

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
E1	240 Volt AC systems.	Electric shock	3	1	1	Systems are designed and installed in accordance with regulatory requirements and PAT procedures are followed accordingly.
E2	12 Volt DC systems.	Electric shock	2	1	1	These are related to battery operation and charging systems. The operators of battery powered locomotives are reasonably expected to be familiar with their equipment and only use the Society facilities for topping up during a running day and this action takes place in the open air. Instruction for the use of the Society battery charging systems are adjacent to the chargers.
E3	24 Volt DC Systems	Electric shock	3	1	1	
E4	Welding Equipment	Electric shock	1	0	0	Welding equipment is brought onto the site as and when required by experienced users.

TABLE "F" VISITING LOCOMOTIVES [In general terms if there is no red entry in a control box when nightime has no influence]

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
F1	Visiting locomotives.	Dangers from unfamiliarity with Cinderbarrow operations.	Na			Refer to the following Items.
F2	Unfamiliarity with methodology for handling heavy loads.	Strain injury. Dropped objects.	2	0	0	LMMES Members supervises the steaming bay operations during an open day when visitors are welcomed. The LMMES Member supervising operates the hydraulic lift and the traverser and the Visitor is responsible for the means of bridging the gap between the trailer or vehicle and the hydraulic lift as only he is familiar with the weight and manoeuvrability of his locomotive.
F3	Unfamiliarity with methodology for locomotive movements onto and off the track circuits.	Confusion resulting in an incident.	3	0	0	LMMES Operating Superintendent (OS) for the day controls the on and off track movements by direct contact with the locomotives driver and radio to the signal box. Semaphore signal at the track circuit entry point also provides the right of way permission to the driver.

F4	Visitor credentials with regard to pressure integrity of the locomotive and validity of insurance cover.	Impaired indemnity. Boiler accident.	3	0	0	Access to the steaming bay is not permitted without prior submission to LMMES reception desk of the following proof: ➢ NAME or Sfed insurance cover for the day of operation of the locomotive. ➢ NAME or Sfed current boiler hydraulic test and steam test certification.
F5	Unfamiliarity with the Cinderbarrow track.	Collision. Derailment.	3	0	0	Visiting drivers and attendants are briefed on the track operations and etiquette including at least the permitted directions of travel, restrictions on reverse travel, signal location and procedures, and level crossing operations. The OS maintains control of the locomotive movements in accordance with the rules and procedures.

TABLE "G" NIGHTIME VISIBILITY ISSUES

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
G1	Driver unable to monitor boiler water level adequately.	High level leads to priming and loss of pulling power. Low level can lead to boiler failure.	3	1	3	Cab water gauges are to be illuminated at night
G2	Driver view of semaphore signal position	Failure to obey a signal	3	1	3	Semaphore signals are illuminated.
G3	Track obstructions not visible to a driver.	Derailment	3	0	0	Final track walk before darkness descends.
G4	Failure of the means of lighting in the general access area.	Confusion when leaving the site in darkness.	2	0	0	All operational staff will have torches.
G5	Nightime access for emergency services.	Barrier height bar limiting access.	2	0	0	Height barrier keys checked for availability.
G6	Driver unfamiliarity with running a steam loco in darkness.	Failure to complete a circuit.	2	0	0	Drivers will have practise runs at night before carrying passengers

TABLE "H" SPECIAL EVENT ISSUES [Applicable when special events such as Halloween are staged)

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
H1	Impact between a sideshow structure and a passenger.	Personal injury.	3	0	0	Any line side attractions will beyond arms reach.
H2	Impact between a sideshow structure and a train.	Derailment and Injury	3	0	0	Any line side attractions will be clear of trains as per TN3.
H3	Impact or strangulation from an overhead structure or festoon.	Personal injury.	3	0	0	Any fixed object crossing or near the track or will be out of reach of passenger Any hanging effects, ribbons etc will not be formed in a loop and will be so secured as to release in the event of any one catching hold
H4	Electrocution from a sideshow apparatus	Personal injury.	3	0	0	No cables cross over or directly under the rails of the track, any such cables will go through the existing ducting
H5	Burns from a sideshow apparatus.	Personal injury.	3	0	0	Any line side attractions should be more than 1 metre from the track
H6	Tipping over due to all passengers leaning to same side to observe sideshows.	Personal injury.	3	1	1	Passengers will be instructed when boarding a train on the procedures to be followed at night.

ITEM REF:	CONSIDERATION	POSSIBLE CONSEQUENCE	EVENT SEVERITY 0=Neg 1=Low 2=Med 3=High	LIKE-LIHOOD 0=Neg 1=Low 2=Mod 3=High	RANKING	CONTROL ACTION
H7	Inadequate Logistical Support	Risk of confusing roles	1	0	1	All staff to be briefed before the event to ensure complete understanding of their duties
H8	Unclear definition of operations.	Hazard to smooth operations. Injury.	1	0	1	See item H7
H9	Food allergies	Health issues	3	0	0	Food is not given or sold to the public by LMMES.
H10	Unfamiliarity with special event track operation.	Hazard to operations	3	0	0	All drivers will have driven in the dark before passenger carrying
H11	Stranded passengers due to failed loco.	Stranded passengers	2	0	0	A standby non-steam powered loco will be held in readiness in the head shunt