

## **5.0 Options considered**

### **5.1 Option 1 – Do nothing (not recommended)**

Completing maintenance on the Fire assets in Engineering Hours and Extended Engineering Hours only will continue to take place between 22:00 to 05:00 where maintenance and cost efficiencies will not be realised.

- LU will continue to operate in the same way as historically
- Costs will remain at current levels and may rise as asset base increases and more operatives are required to complete maintenance
- Potential efficiencies from the work being completed by each maintenance team will not be realised.
- With the imminent introduction of Night Tube and the unavailability of Friday and Saturday nights there will be no chance to recover missed works or perform tasks whose duration cannot be completed during standard Engineering Hours.

### **5.2 Option 2 – Use an ALL Hours initiative to carry out Maintenance (recommended)**

Complete selected maintenance (as detailed in section 4 & Appendix 2) within All Hours.

- Safer working arrangements by allowing longer periods of time to complete maintenance.
- Achieving full legal compliance with the Regulatory Reform (Fire Safety) Order, British Standards and LU requirements.
- Ensure corrective works are done in time to ensure full operation of the system.
- Efficiencies and cost savings maybe realised with more effective working patterns

## **6.0 Operational Arrangements**

The Fire Maintainer will request access to the identified sections of the fire systems for ALL Hours. After signing in with the Landlord the Fire Maintenance Team Leader will confirm the maintenance activity being undertaken and agree any time periods where the activities may be restricted. In addition confirm any additional mitigation that will be put in place, eg. Engineer monitoring MFPCP (Main Fire Control Panel). Operational issues will be different at each site and site specific risk assessment will be undertaken.

## **7.0 Scheduling and Access**

Changes to the access requirements and to the scheduling will be required once this proposal is accepted. The start date for maintenance will be amended to reflect the efficiencies and the revised programme loaded onto the mainframe management system.

## **8.0 Staff specific issues**

Regarding access to the site, Fire Maintenance teams will book on with the Landlord.

Due to maintenance teams working longer hours they may need to take their half hour break during their time on site. Under the Workplace Health, Safety and Welfare Regulations (Temporary Work Location section) the company should provide facilities for messing etc where practical. Agreement will be made for each site as to which and when the mess facilities can be used on condition that they are left in a clean and tidy condition for other users. The Landlord should be briefed so there are no issues regarding mess room access. In the event that station/location welfare facilities cannot be used, the Fire Maintainer will provide welfare facilities.

## 9.0 Risks associated with the proposal

The risks associated with the proposal are detailed in Appendix A1. The main risks are summarised below:

Risk I.D.	Risk	Unmitigated risk rating (H/M/L)	Required risk controls	Mitigated risk rating (H/M/L)
1	Breach of regulations if maintenance work not done within statutory requirements	H	Extended ALL Hours enables more efficient compliance with statutory requirements and adequate time to complete all task and maintain compliance	L
2	Frustrated access during work	M	Effective communication through Liaison Team with LU area management/Landlord to ensure staff are briefed on works being undertaken	L
3	Unforeseeable conditions encountered on site	M	Risk Assessed, to ascertain if works can be carried out	L
4	Movement of Materials Impact Station Use	M	Identify large items of plant/materials in advance and only move in Engineering Hours	L
5	No audible alarm if device is activated on zone/loop under test	M	For addressable fire alarm maintenance, an engineer will remain at the fire panel whilst other engineers conduct maintenance in the field. Engineer at fire panel acknowledges the alarm. Alert landlord of situation and allow landlord to follow their normal process. Engineers offer assistance to landlord to accelerate their process.	L

*Summary Risk Table for Fire Maintenance ALL Hours working.*

It is anticipated that various scenarios will occur during testing, the most possible scenarios are detailed below. These have been the rational on which the Risk Review in Appendix 1, has been completed:

### Scenario 1:

A separate device activation could occur during testing of other devices on the same zone/loop that is in test:

- Engineer at fire panel acknowledges the alarm.
- Alert Landlord of situation and allow Landlord to follow their normal process.
- Engineers offer assistance to landlord to accelerate their process

**Scenario 2:**

An asset activation could occur during testing on a different zone/loop to that which is in test on the fire panel:

- Alert Landlord
- Allow Landlord to follow normal process. Engineers offer assistance to Landlord to accelerate the process.

**Scenario 3:**

An engineer may make an omission and place an incorrect zone/loop in test resulting in fire activation through testing an asset in the intended zone/loop:

- Engineer at fire panel acknowledges the system
- Engineer alerts Landlord (on manned sites) of situation and allow Landlord to follow normal process. Engineers offer assistance to Landlord to accelerate their process
- Incorrect zone/loop is taken out of test by engineer
- Confirm it was their testing and request reset
- Correct zone/loop is placed in test by engineer

**10.0 Measures of Success / Failure**

The measure of success / failure of this proposal will be:-

Success

- Maintenance completed within statutory timescales
- Greater % utilisation of scarce resources
- Number of incorrect activations of fire alarms reduced as a result of maintenance undertaken in ALL Hours

Failure

- Increase in number of station evacuations as a result of maintenance undertaken in ALL Hours
- Failure to complete maintenance tasks within statutory timescales.

**11.0 Communication Requirements**

Upon approval of the proposal:

- The amended working arrangements will be communicated to the landlord through the AP Stations Liaison team.
- The LU AP's will liaise with all stakeholder's (the landlord, LFEPa, H&S subgroup) to confirm the maintenance works that will be undertaken during ALL Hours.
- Communicate to all LU Stakeholders via the LU communications team

## Appendix 1 – Risk Review Details

Risk Id	Title	Further Description / Detail	Current Probability	Current Impact	Current Exposure	Mitigations to reduce probability and / or impact	Target Probability	Target Impact	Target Exposure
1	Breach of regulations if maintenance work not done within statutory requirements	Breach of Statutory Regulations, LU Standards etc. Increasing number of fire assets resulting in pressure to get works done in current available time. With the imminent introduction of Night Tube and the unavailability of Friday and Saturday nights there will be no chance to recover missed works or perform tasks whose duration cannot be completed during standard Engineering Hours.	4	5	20	Extended ALL Hours enables more efficient compliance with statutory requirements and adequate time to complete all task and maintain compliance	2	2	4
2	Frustrated access during work	Access to rooms, critical areas, no keys etc. Landlord not willing to grant early access	3	3	9	Effective communication through Liaison Team with LU area management/Landlord to ensure staff are briefed on works being undertaken.	2	2	4
3	Unforeseeable conditions encountered on site	SSOW (Safe System of Work) in place for unforeseen conditions encountered on site	3	3	9	Risk Assessed, to ascertain if works can be carried out.	2	2	4
4	Movement of Materials Impact Station Use	Movement of materials impacts station use by removal of lift/escalator/passageway use.	3	3	9	Identify large items of plant/materials in advance and only move in Engineering Hours.	2	2	4
5	No audible alarm if device is activated on zone/loop under test	Device activated that is not part of testing works	2	4	8	For addressable fire alarm maintenance, an engineer will remain at the fire panel whilst other engineers conduct maintenance in the field. Engineer at fire panel acknowledges the alarm. Alert landlord of situation and allow landlord to follow their normal process. Engineers offer assistance to landlord to accelerate their process.	1	2	2
6	Evacuation of station triggered by maintenance activity	Cleaning of fire asset as part of maintenance creates dust which triggers fire alarm.	2	3	6	Cleaning methods employed will ensure dust is not created which could trigger alarms. This includes the use of hand held vacuum cleaners. For addressable fire alarm maintenance an engineer will remain at fire panel while other engineers conduct maintenance in the field. All engineers will be in radio contact to confirm assets tested and identify any rogue asset activations. If activation occurs of devices not being tested, engineers on site will liaise with station staff/Landlord to confirm incorrect activation and prevent station evacuation	1	2	2
7	use of welfare facilities for work	All hours working on site creates requirement for toilet and mess facilities	3	2	6	Arrangements made with Landlord/Staff to enable contractors to use station facilities. Where this is not possible contractor to supply welfare facilities.	1	1	1
8	Customer interface	Disagreement/altercation with general public	2	3	6	Familiarisation of customer interface conflict resolution.	2	2	4
9	Activations of plant interfaces	Interface for lifts, emergency ventilation etc.	2	3	6	Check loop listings for plant interfaces and isolate according to prevent unwanted activation.	2	2	4
10	Work impacts station use.	Maintenance activity leads to disruption to Station staff/Landlord or public	2	2	4	Liaise with LU of extent on permitted maintenance to enable Work Instructions and Workplace Risk Assessments to be updated. This is in particular with regard to isolations of assets in non-public areas and maintenance requiring hydrant cupboards to be open during traffic hours. All activities to be undertaken in traffic hours will have risk assessments.	1	1	1

Risk Id	Title	Further Description / Detail	Current Probability	Current Impact	Current Exposure	Mitigations to reduce probability and / or impact	Target Probability	Target Impact	Target Exposure
11	Co-ordination of work on site	Other work going on at same site	2	2	4	Agree schedule with 3rd parties and landlord including any necessary re-scheduling to avoid clashes.	1	1	1
12	Water spillage	Minor spillages from Hose Reel or Hydrant maintenance	2	2	4	Carry container to contain spillage. Use mop & bucket to mop up any spillage that occurs. If required, display appropriate signage.	1	2	2
13	Impact on 3rd parties	Alarm which causes Evacuation or 3rd party premises (i.e. shopping centre, tenancy, adjoining buildings etc.)	2	2	4	Liaise with 3rd party and communicate at start/during/end of testing	2	2	4
14	Increased interface with public	Contractors may come into contact with customers when carrying out visual inspection and cleaning of valves of dry droppers in cabinets on platforms	1	2	2	Contractors Work Instruction to be amended to cover working on platforms during traffic hours, ensuring that work area is adequately protected. Works only to take place where unobstructed distance to station platform edge is not reduced below 2m. Guidance document/briefings issued to maintainers on interaction with public	1	1	1
15	Asset Information/Records from Maintenance are inaccurate	Lack of clarity on site and risk of false alarms	2	1	2	Site survey required to gain knowledge of the system. If anomalies identified, records will be updated. Compile test plan from updated records.	1	1	1
16	Work impacts other assets	Maintenance on Fire assets may be programmed where other asset areas are also working	1	1	1	Works will be coordinated with AP Fire Asset manager to avoid clashes. Where escalator refurbishment works co-inside with maintenance works, maintenance will be re-programmed where possible	1	1	1
17	Work Overruns	Works not completed to agreed time scale to enable Landlord to conduct checks for planned Close/Re-open of the station/Location.	1	1	1	Works will cease at a safe point prior to agreed suspension times.	1	1	1
18	Movement of materials damages assets	Movement of materials required to carry out maintenance causes damage to other assets	1	1	1	Agree access routes with Landlord and Access Planning Team at start of shift. Any damage caused will see the Landlord notified immediately and rectification works agreed along with time scale	1	1	1
19	Work leads to trips incidents	Equipment or materials create trip hazard	1	1	1	Risk Assessment will be in place. Barrier works area off including plant. Appropriate signage to be in place, with agreement of landlord.	1	1	1

Top 5 Risks identified above will be further explained in section 9 of the main document

		Current Impact				
		1	2	3	4	5
Current Probability	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

**High Risk (Risk Range 16 to 25)**

**HIGH**

Risk totally unacceptable.

Additional control measures must be put in place and risk re-assessed

**Medium Risk (Risk Range 5 - 15)**

**MEDIUM**

Additional control measures to make risk ALARP should be assessed in the Task Specific Method Statement.

**Low Risk (Risk Range [1 - 4])**

**LOW**

With control measures in place risk is ALARP.

Likelihood	
1	Very Unlikely
2	Unlikely
3	Likely
4	Very Likely
5	Certain

ALARP = Risk has been assessed as low as reasonably practicable.

## **Appendix 2 – SCOPE : Maintenance of Fire Assets during Traffic Hours.**

### **PURPOSE**

The purpose of this appendix is to provide the detailed specific scope for the Planned Preventative Maintenance of Fire Assets during All Hours. This document is intended to be read in conjunction with The Case for Safety.

For locations other than stations Maintenance activities are to be agreed with the landlord.

### **Scope of Works specified below:-**

#### **Methodology**

##### **Maintenance Procedures - Electrical & Mechanical Elements of Fire Systems**

The frequency of the maintenance testing on the Electrical elements of the Fire system is as a minimum defined in BS 5839. The specific parts of BS 5839 will be relevant to the asset in question.

The frequency of the maintenance testing on the Mechanical elements of the Fire system is as a minimum defined in BS 5306. The specific parts of BS 5306 will be relevant to the asset in question.

During any intrusive maintenance activity where there may be potential to cause unwanted alarm to the system being maintained or any related premises Fire System; all relevant parties are to be informed and appropriate announcements made.

During Maintenance activities, unless testing requires a fully functional system, the system will be in test mode. During test mode, at all times a competent engineer will attend the Main Fire Control Panel (MFCP) and will be in radio contact with the field engineers carrying out testing.

In the event of site supplied 2 way radios not being available at Stratford Market Depot & Neasden Service Control Centre, the use of the Maintainers 2 way radios shall be used. As a last resort, the use of mobile telephones will be employed.

Defects identified during maintenance inspection and testing will be rectified during the maintenance visit or referred for subsequent rectification to agreed time scales.

#### **Control & Indicating Equipment**

### **4.1 Main Fire Control Panel**

#### **Visit Frequency in accordance with BS 5839**

- Check panel condition & status; obtain Panel status printout where available. Confirm that the Power & Delay LEDs (non Mk1a fire panel) are illuminated
- Download a list of all loop detection device analogue levels, highlight any devices that are out of tolerance and replace as required. Any replaced devices should be re-tested and Fault/Fire printouts retained within the Maintenance Documentation.
- Ensure all auxiliary interface equipment connected to the Main Fire Control Panel operate correctly (See "Auxiliary Systems" section)
- Ensure all faults and printouts match both the station identification numbers and descriptions shown on the Station Fire Plans issued with the maintenance information pack. Confirm currency of the station held fire plans.

- Ensure printer paper and ribbon is sufficient after all testing is complete, change if required
- Remove any debris that may be inside the panel, clean panel with appropriate materials; ensure all locks are in good working order
- Download a list of all field devices and crosscheck these with the Station held Fast Track documents. Provide updated fire panel messages if required
- Record serial numbers and software issue of panel

## **4.2 Fire Control Panel Repeater & Networked Panels**

### **Visit Frequency in accordance with BS 5839**

- Check panel condition & status. Confirm that the Power & (where required) Delay LEDs are illuminated on Repeater & Networked Panel
- Ensure all faults and printouts match both the station identification numbers and descriptions shown on the Station held Fire Compliance Plans
- Ensure printer paper and ribbon is sufficient after all testing is complete, change if required
- Remove any debris that may be inside the panel, clean panel with appropriate materials; ensure all locks are in good working order
- Take printouts from panel of Loop Devices and Panel Status (where applicable)
- Record serial numbers and software issue of panel

## **4.3 Remote Audio Visual Driver Unit (RAVDU) System**

### **Visit Frequency in accordance with BS 5839**

- Check condition of RAVDU Panel
- Carry out Battery Inspection & Testing as per Maintenance Documentation requirements
- Remove any debris that may be inside the panel, clean panel with appropriate materials; ensure all locks are in good working order
- Carry out Power Source Inspection and Testing as per Maintenance Documentation requirements
- Ensure all Panel internal field wiring terminations, internal wiring and ribbon cables are secure
- Check condition of all sounder and beacon units. Ensuring they are securely fixed and not impaired in any way, clean as required with appropriate materials
- Ensure all strobe/sounder units are in correct position on Asset Drawing
- Record serial numbers, Loop and Device detail

## **4.4 Fire Voice Alarm**

### **Visit Frequency in accordance with BS 5839**

- Check condition of Fire Cryer Panel.
- Remove any debris that may be inside the panel, clean panel with appropriate materials; ensure all locks are in good working order
- Ensure all sounder units are in correct position on Asset Drawing
- Record serial numbers, Loop and Device detail

#### **4.5 Emergency Do Not Enter (EDNE) Panel System**

##### **Visit Frequency in accordance with BS 5839**

- Check condition of EDNE Panel.
- Carry out Battery Inspection & Testing as per Maintenance Documentation requirements
- Remove any debris that may be inside the panel, clean panel with appropriate materials; ensure all locks are in good working order
- Carry out Power Source Inspection and Testing as per Maintenance Documentation requirements
- Remove any debris that may be inside the signs, clean signs with appropriate materials; ensure all locks are in good working order
- Ensure EDNE Panels & Signs are in correct position as per asset drawing
- Record serial numbers, Loop and Device detail

#### **4.6 Emergency Do Not Enter (EDNE) Signs (Loop driven or Plunger activated)**

##### **Visit Frequency in accordance with BS 5839**

- Check condition of EDNE Signs
- Remove any debris that may be inside the signs, clean signs with appropriate materials; ensure all locks are in good working order
- Ensure all EDNE units are in correct position as per asset drawing
- Record serial numbers, Loop and Device detail

#### **4.7 Underground Ticketing System (UTS) interface panel**

##### **Visit Frequency in accordance with BS 5839**

- Check condition of UTS Panel
- Remove any debris that may be inside the panel, clean panel with appropriate materials; ensure all locks are in good working order
- Ensure UTS Panel is in the correct position as per the asset drawing
- Record serial numbers, Loop and Device detail

#### **4.8 UTS loop interface**

##### **Visit Frequency in accordance with BS 5839**

- Check condition of all UTS units
- Ensure UTS Panel is in the correct position as per the asset drawing
- Record serial numbers, Loop and Device detail

#### **4.9 Escalator Wet Sprinkler System (EWSS) Electrical**

- Any MAINTENANCE will ONLY be carried out on escalators taken out of service as planned by station staff/Landlord prior to Engineering Hours which also have the adjacent unit out of service.
- No compact or hard access units will be worked on during operational hours except behind a hoarding.