Guidance Note

Fire Industry Association

Guidance for BS 7273 – 6:2019 Code of practice for the operation of fire protection measures. Fire detection and fire alarm systems. Interface with ancillary systems and equipment.

FIA Guidance Document – Guidance for BS 7273 – 6:2019 Code of practice for the operation of fire protection measures. Fire detection and fire alarm systems. Interface with ancillary systems and equipment.

NOTE: *This Guidance Note is not meant to replace the need for referring to BS 7273 – 6:2019.*

1. SCOPE

This part of BS 7273 gives recommendations for the design, installation, commissioning and maintenance of interface arrangements between fire detection and fire alarm (FD&FA) systems conforming to BS 5839-1:2017 and various ancillary systems and equipment (ASE), where this interface is required by the fire strategy for a building, excluding the interface with those systems covered in other parts of the BS 7273 series.

2. DEFINITION OF RESPONSIBILITY

Responsibility can be determined from the scope diagrams from both BS EN 54 – 1 and BS 7273 – 6 as shown below Figure 1 and Figure 2 respectively. It can be seen that the scope of a FD&FA system ends at the O/P unit, Item G. Whereas the scope of BS 7273 – 6 starts with the critical signal path connecting Item G to the associated Ancillary Systems and Equipment, ASE item H.

"BS 5839 – 1 clause 6.2f); Where a fire detection and fire alarm system is to be interfaced with another system or facility (such as a fire extinguishing system, smoke control system or lift grounding facility) that is the responsibility of an organization other than the installer of the fire detection and fire alarm, the responsibility of each organization should be clearly defined and documented."

For example, it may be desirable for the FD&FA system installer to leave a "tail" connected to the O/P unit for the installer of the ASE to connect to thereby negating the need for access to 3rd party equipment.

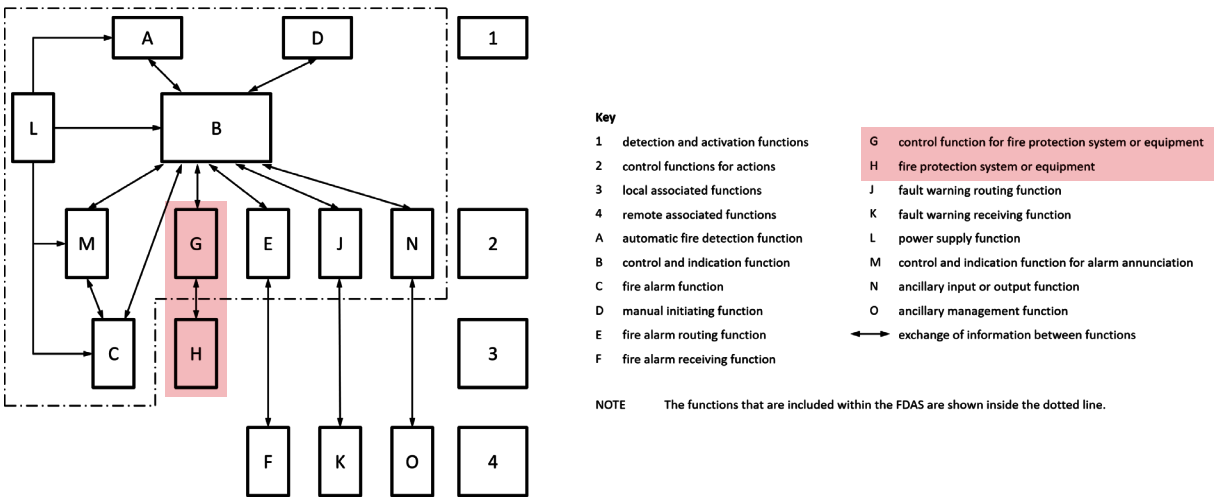
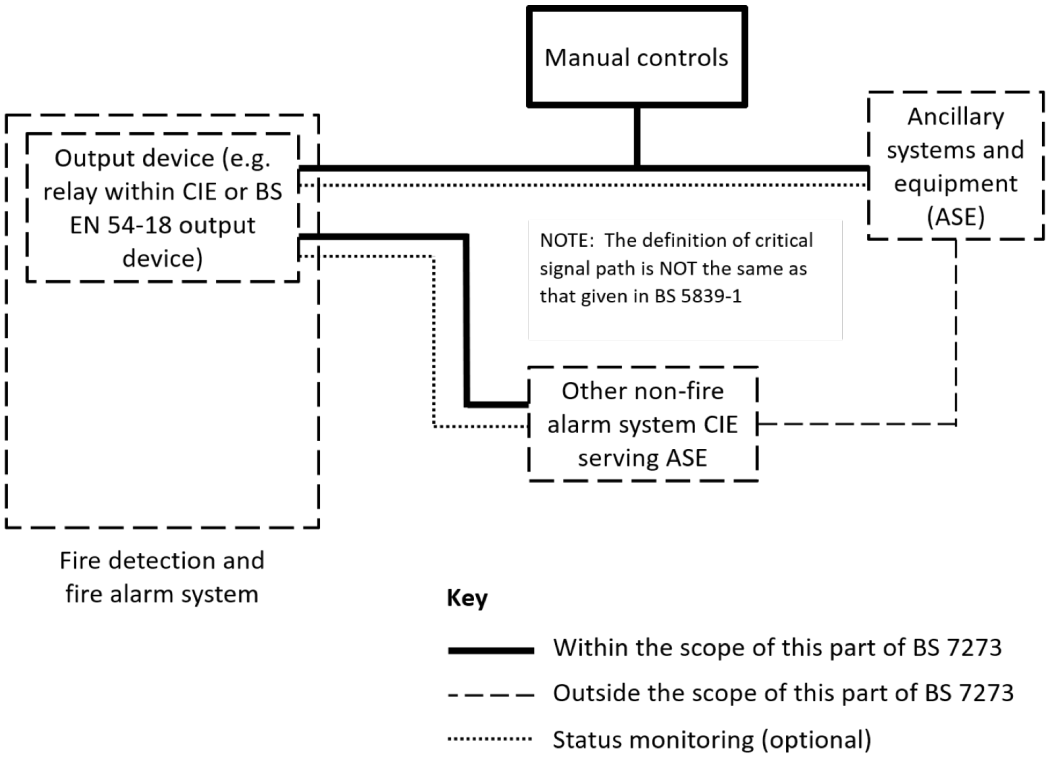


Figure 1: BS EN 54 – 1



NOTE 1: *Any special recommendatios for provisionand siting of fire detectors and manual call points are within the scope of this part of BS 7273.*

NOTE 2: *The effect of failures of power supply for the devices is within the scope of this part of BS 7273.*

Figure 2: BS 7273 – 6

3. ASE COVERED BY BS 7273 – 6

Arrangements covered by this part of BS 7273 include the interface between fire detection and fire alarm systems and:

- smoke control systems;
- lifts and other lifting appliances;
- gas valves;
- fire-resisting shutters and active fire curtain barrier assemblies;
- electricity supplies;
- ventilation systems including dampers;
- lighting, intelligent signage and wayfinding; and
- paging systems.

For guidance as to the need for or operation of any of the above please refer to BS 9999 Fire safety in the design, management and use of buildings – Code of practice.

4. GENERAL RECOMMENDATIONS FOR INTERFACE CONNECTIONS

BS 7273 – 6 allows, where necessary, for the fire detection and fire alarm system to provide power to operate ASE, in the quiescent or the alarm state, however the power requirements should be quantified and provision should be made by specifying the appropriate rating for the fire detection and fire alarm system power supply or by providing an ancillary power supply together with protection against excessive loading (e.g. fused). Be aware however that BS 5839 – 1 clause 9.2d) recommends that this should not occur, it is therefore critical that any power consumption of the ASE is considered when calculating battery capacity of the FD&FA system. This may also require a variation to BS 5839 – 1.

NOTE: *The power supplied to the ASE from the FD&FA system to be taken into account in the FD&FA system battery calculations includes power to the ASE and any interlinking between the two systems.*

When interfacing a fire detection and fire alarm system to ASE, means should be provided to test the respective systems or equipment during regular maintenance.

Where the ASE cannot practicably be regularly activated, the interconnection should be monitored and it should be possible to determine the ASE availability. If the ASE is unavailable due to a fault, disablement, disconnection or loss of power an appropriate Fault indication should be given on the FD&FA system.

Where it is not acceptable to activate the ASE during regular testing of the FD&FA system, either by the FD&FA service engineer or the end user, means should be provided to disable the interface between the systems. In this case, an indication should be given at the fire alarm CIE to indicate that the interface is disabled in accordance to BS EN 54 - 2.

Where operation of ASE is critical for safety in case of fire, the interface to the ASE should fail in a safe condition, taking into account the cause and effect of the ASE.

The requirement to activate any ASE by the FD&FA system and as to whether the ASE requires status monitoring is determined by the fire strategy for the premises.

The following information/documentation should be included in the Fire Safety Document for the building. This is a legal requirement to conform to Regulation 38 of the Building Regulations.

- where there is a variation in the actuation arrangement from the recommendations of this, or any other, British Standard, justification for the variation;
- the actuation arrangement upon receipt of a specified signal from the fire detection and fire alarm system;
- the actuation arrangement upon loss of power supply;
- clarification of the definition of “fail-safe” if this is to refer to any other aspects other than fire (e.g. security arrangements);
- any consequences for the building in the event that the actuation or the cause and effect arrangements fail to operate as designed; and
- confirmation that the arrangements have been agreed with the relevant stakeholders.

5. SPECIFIC ASE REQUIREMENTS

Smoke Control Systems

If the FD&FA system does not include a test facility to manually test a smoke control system or equipment a test facility should be provided to simulate the activation of a fire detector. The reason for this is to enable the end user to test the smoke control system without having to test the FD&FA system. If different FD&FA zones invoke different C&E then a test facility as above should be provided for each FD&FA zone.

Lifts

The Fire Strategy determines which lifts or lifting appliances either need to be taken out of service or remain in operation for use by specified groups, Fire and Rescue Service, evacuation etc.

The following should be agreed between the building designer, the FD&FA system designer and the lift provider;

- the use and operation of any lift or lifting appliance in response to an input from a fire detection and fire alarm system;
- the signals required from the fire detection and fire alarm system to the lift or lifting appliance controls; and
- the interface specification for signals between the fire detection and fire alarm system and the lift or lifting appliance controls.

Gas Valves

The Fire Risk Assessment for the site may require shutting off the gas supply in the event of a fire by activating a safety-shut off valve (SSOV), there is however, at this moment in time, no legal requirements or requirements in any other BS for this to occur.

SSOVs are generally designed to “fail-safe” thus the designer needs to establish both the need for the interface to “fail-safe” and the monitoring of the interconnection between the interface and the SSOV.

The activation of the interface will usually be from specific detection devices and not from a general fire alarm. The devices associated with the SSOV activation should be clearly indicated in the C&E schedule and this may also include the need for coincidence detection.

Fire-resisting shutters and active fire curtain barrier assemblies

Generally, for L3, L2 and L1 category FD&FA systems no special requirements for additional or repositioning of detectors are required. However, if an L5/M or L4 system is installed then reference to clause 11 in BS 7273 - 6 should be followed as to the positioning and additional detector requirements.

Electricity supplies

It is not usual to isolate the electrical supply to the whole premises as some supplies may be required for essential facilities to remain in operation. It is for this reason that a detailed C&E analysis will be required prior to the isolation of any power supply as to the effect of the isolation on business continuity etc.

Note that if electrical supplies are to be isolated by the FD&FA system activation, DON'T forget to include any associated back up power supply.

Ventilation systems (other than those used for smoke clearance or control)

The fire strategy will normally recommend the C&E requirements for the ventilation systems with further guidance available in BS 9999. Where, however, it is recommended to shut down a ventilation system on confirmation of a fire within the building, the FD&FA system needs to incorporate features to minimize false alarms such as the use of coincidence detection or the application of advanced multi-sensor detector technology.

Fire and Smoke Dampers

BS 7273 – 6 is only concerned with electrically operated dampers.

Dampers may be operated directly from an O/P from the FD&FA system or by an O/P from the FD&FA system to a dedicated damper control system.

The fire strategy for the building will determine the level of FD&FA system required to control the HVAC system as will the testing and status monitoring requirements.

Lighting, intelligent signage and wayfinding

The interfacing of ASE and control systems should not prejudice the fail-safe operation of the separate systems.

Paging systems

BS 7273 – 6 covers paging systems utilized for alerting as to Fire, Faults etc. on the FD&FA system, as well as paging systems for deaf or hard of hearing people which is covered in more detail in BS 5839 – 1 clause 15.

It should be remembered that fire and fault messages from the CIE should take precedence over all other general paging messages.

Cables, wiring and other interconnections

All cables and interconnections should be as detailed in BS 5839 Part 1 and BS 7671.

Unless a cable fault has the same result on the ASE as a fire alarm signal then the cable should be fire rated as per 26.2 of BS 5839 Part 1:2017.

This fire rating recommendation does not apply however to a “flying lead” not greater than 1m fixed to an item of ASE at the time of manufacture.

Note that BS 5839 Part 1 18.2.1 b) Tactile alarm devices provided for people who are Deaf and hard of hearing states “flexible cables attached to devices should be protected against fire if they are greater than 3 m in length.”

6. ELECTROMAGNETIC COMPATIBILITY (EMC)

EMC principles, in accordance with the EMC Directive, must be applied and recommendations on how to achieve this may be found in BS 5839 Part 1:2017 Incorporating Corrigendum No.1 Clause 28, however, there may be a potential for the interface between the FD&FA system and any ASE to affect the immunity of either system, it is therefore recommended that Interface equipment between the critical signal path, or the CIE, and the ASE should incorporate galvanic isolation or appropriate filtering to minimize any risk of malfunction due to electrical interference.

Cables carrying power or signals to ASE should not be introduced into the CIE of the FD&FA system, unless the manufacturer of the FD&FA equipment confirms that this will not detrimentally affect the performance of the FD&FA system as a result of electromagnetic interference.

7. ELECTRICAL SAFETY

As in BS 5839 Part 1 the system should meet the SELV installation requirements of BS 7671 and when connecting to any ASE it is important that the SELV requirements are not compromised.

Care should be taken if introducing power supplies from other systems into the FD&FA system CIE therefore it is preferred to terminate other system circuits externally to the FD&FA system CIE e.g. via junction box adjacent to the CIE where safe isolation facilities can be incorporated.

8. COMMISSIONING

The testing required during the commissioning process is detailed in Clause 19 of BS 7273 – 6 and should be followed.

In general, the aspects to be checked during commissioning are as follows;

- The programming of the interfaces are to be checked as being correct as for the C&E requirements.
- The operation of the ASE are to be checked for correct operation on receipt of a fire alarm signal.

The above two points may be carried out by different organizations, FD&FA system engineer, ASE installer/manufacturers engineer and/or a third-party engineer.

The responsibilities of each organization, if appropriate, are to be clearly defined.

The checking of the interface programming is not to determine that the C&E is appropriate but to make sure the system operates as designed according to the C&E.

9. ROUTINE TESTING (USER)

Routine testing requirements are fully detailed in Clause 20.1 of BS 7273 – 6.

In situations where operation is deemed to be fail-safe it is still recommended to test the interface and ASE to indicate any component type failure or mechanical obstruction.

Routine testing should be carried out at the following time periods;

- For interfaces to ASE as per Clause 11 (Fire-resisting shutters and active fire curtain barrier assemblies) and those to smoke control systems protecting means of escape, (other than blocks of flats which should be tested monthly): Weekly
- All other interfaces to ASE: Monthly

Testing should be by the activation of the FD&FA system or by the dedicated test facility if provided. Also, during testing it is to be confirmed that the ASE changes state in response to the fire alarm signal.

If the above testing of the ASE operation is not checked during the FD&FA system weekly testing, then a separate test regime is required to check this. If a separate test regime is utilized it would be of benefit to inhibit the activation of fire alarm sounders during the testing to prevent staff hearing the fire alarm on numerous occasions.

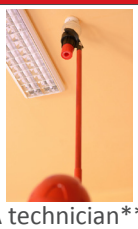
10. INSPECTION AND SERVICING

Detailed recommendations for the inspection and servicing are detailed in Clause 20.2 of BS 7273 – 6.

In the same manner as BS 5839 – 1 the inspection and servicing visits should not exceed 6 months.

Where this may be carried out at the same time as the FD&FA system inspection and service visits and by the FD&FA system servicing organization it should be recognized that this should be as part of a separate agreement. It is also possible that the FD&FA system servicing organization does not have the competency to test all the various types of ASE (resetting manual resettable dampers, lift controls etc.) and may require the use of a competent third-party organization.

The inspection and servicing of the ASE is additional to the recommendations within the FD&FA system inspection and servicing requirements. It is not to be assumed that an FD&FA system service visit has checked the change of state/operation of any of the ASE unless agreed between end user and FD&FA servicing organization.

	User		Competent Person*	
		 BS 7273 part 6 ref.	  ASE technician or FD&FA technician**	
Type of ASE	**Routine testing**	**Annex**	**Inspection & servicing** 6 monthly or 6m plus a portion of 12m	**Inspection & servicing** 12 monthly or 6m plus a portion of 12m
Smoke Control Systems	Weekly***	A4	• Check log book and that faults have been attended to • Visual check of any changes to occupancy or structure • Check of batteries and fault conditions • Any 6m checks & tests as specified by ASE manufacturer • Report to PM and complete log book and certification	• Carry out a 6-monthly check • Test all manual controls and replace primary (NR) batteries • Visually inspect readily accessible cable fixings • Any 12m checks & tests as specified by ASE manufacturer • Report to PM and complete log book and certification
	Monthly	A3		
Lifts (inc fire-fighting)	Monthly	A5		
Gas Valves (SSOV)	Monthly	A1 A2		
Fire-resisting Shutters, Curtains & Dampers	Weekly	A3 A4		
Electricity supplies (inc any auto stand-by)	Monthly	A1 A2		
Ventilation systems (HVAC)	Monthly	A3 A4		
Lighting (emergency) & Signage	Monthly	A4		
Paging systems for alerting key staff ****	Monthly	A6		

** *Requires specialist knowledge, information and access to spares for both the ASE and the FD&FAS.*

** *BS 7273-6 implies a separate contract to the maintenance of ASE or FD&FAS.*

*** *Smoke control systems supporting means of escape (not blocks of flats).*

**** *Paging systems to evacuate the deaf or hard of hearing are covered in BS 5839-1.*

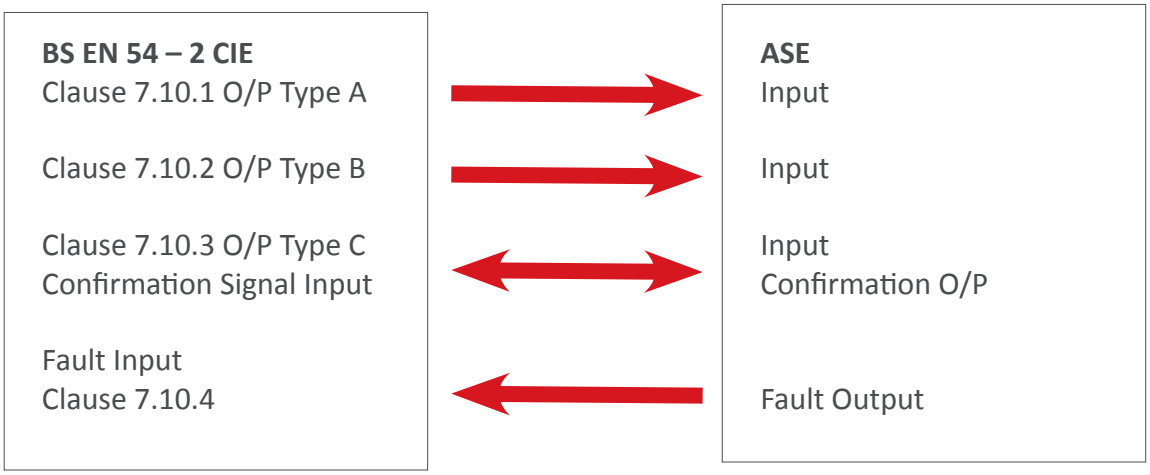
Table 1: Frequency and Overview of Routine Testing and Inspection & Servicing as per BS 7273-6 (See clause 20 for specific detail).

ADDENDUM

Additional guidance/advice when referring to this guide.

a) It is not the responsibility of the Fire Alarm Designer to specify the C&E programme for the premises, that is determined from the Fire Strategy/Fire Risk Assessment. They may however be required to construct a C&E diagram/chart which diagrammatically shows the correlation between an activation in the FD&FA system and the corresponding activation of the associated ASE.

b) When referring to the general recommendations for interface connections section reference should be made to BS EN 54 – 2 clause 7.10 for types of O/Ps and I/Ps (as options with requirements) when using the FD&FA system CIE for interfacing to fire protection equipment/ASE. BS EN 54 – 18 should also be referenced when using FD&FA system field devices as interfaces to fire protection equipment/ASE.



c) Remember that if the connection between FD&FA and the ASE is to be monitored "clean" contacts within the CIE, such as the Common Fire and Common Fault relays, should not be used as they cannot be monitored for open or short circuit.

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