ISCVE

INFORMATION

Voice Alarm System Guide
For Specifiers

Institute of Sound, Communications
and Visual Engineers Ltd

iscve.org.uk

A Voice Alarm Systems Guide for Specifiers

(Acoustic Consultants/M&E Consultants/System Designers/End Users/Facility Managers/Building Managers /Fire Safety Managers etc.)

Voice Alarm Systems (VAS) should only be specified and designed by qualified professionals with an indepth knowledge of these systems.

Designers and Specifiers should have a full understanding of the relevant applicable Standards, and have received formal training from academic or a recognised industry body.

It would also be an advantage to have had hands-on experience of these systems in an installation, commissioning or maintenance capacity.

Example specification clauses are provided at the end of this document, as a guide to the minimum requirements for a VAS in buildings. It is not expansive and all inclusive – there may well be situations where a more complex solution is required. In some instances you may require the services of a professional audio systems designer/electro-acoustician, and the ISCVE has a wealth of these type of people and organisations who would be more than happy to help you with your enquiry. www.iscve.org.uk

Under the right circumstances, Voice Alarm Systems (VAS) in buildings have been proven to be the most effective way to evacuate the premises in the event of an emergency. This is primarily because people respond more promptly to a verbal message, as opposed to a Fire Alarm sounder or bell. This is because a VAS uses the 'spoken' word, giving clear instructions of the action that needs to be taken.

This is particularly important in buildings where a) occupants are only visiting on a temporary basis and may not be familiar with their surroundings [eg shopping centres, transport terminals, public buildings and the like] and b) large buildings that operate a phased evacuation Cause and Effect strategy.

Messages may be pre-recorded (triggered by a monitored link from the Automatic Fire Detection system) or live announcement broadcasts from an emergency microphone(s) at a Fire Control location in the building.

VAS must meet the requirements of the current versions of BS 5839-8, BS EN 54-16, BS EN 54- 24, the Consultants system performance specification and local regulatory requirements. BS EN 50849 covers Sound Systems for Emergency purposes (but not linked to a Fire Alarm system). In Sports Stadia BS 7827 and The Green Guide should be consulted.

The importance of these systems cannot be under-estimated. They are critical life safety systems that need to operate after a fire has started and continue working throughout the entire emergency evacuation process. Therefore, they must be highly secure and robust – utilising fire-rated cabling, secondary power supplies (integral batteries) and full system monitoring to ensure any faults are notified promptly, so that repairs can be completed without delay. These are emergency evacuation systems that must be available at all times – they do save lives.

Public Address (PA) Systems, where not relied upon for use in emergencies, do not qualify as VAS, as they do not meet any of the above Standards.

Responsible Premises Management, as defined in BS5839-8:2023 Section 6, need to be aware that they have a legal responsibility for ensuring the correct operation, testing and maintenance of these critical life safety systems is carried out – and for maintaining up-to-date records.

Ongoing operational training, testing and maintenance arrangements of the VAS all come under the legal duties of the single nominated member of the Premises Management. This includes documented weekly testing of the VAS by nominated staff in accordance with clause 39.1 in BS 5839-8:2023 and documented 6 and 12 monthly maintenance inspections by a competent organisation with adequate access to spares and a good knowledge of the system, in accordance with clauses 40.1 and 40.2 in BS5839-8:2023.

Consideration may also be given to having the VAS system third-party verified upon completion of the installation, or, if the system has been inherited – or if service and maintenance records are not available.

The ISCVE offers the 'VA for Responsible Premises Management' training course, designed to understand the legal responsibilities of this role. Details can be found in the Training section of the website.
https://iscve.org.uk/training-development/training-courses/voice-alarm-skills/#vapremises

The ISCVE also has highly experienced Members capable of carrying out maintenance of VAS. Contact info@iscve.org.uk for more information. With regards to operational training, the ISCVE has an excellent guide to assist in the training of microphone users. Click on the link below to download a copy of this guide.

https://iscve.org.uk/standards/a-guide-for-training-microphone-users-of-sound-systems-and-other-communication-systems/

Finally, the ISCVE has highly experienced Members capable of carrying out third party verification of VAS.

Contact info@iscve.org.uk for more information.

EXAMPLE SPECIFICATION CLAUSES

1.0 SYSTEM OBJECTIVES

The Voice Alarm System (VAS) shall be designed in accordance with BS 5839-8:2023. Loudspeakers shall be provided throughout the building to ensure that an audible and intelligible announcement can be heard in all areas.

The VAS shall be a type V3 system as detailed in BS 5839-8:2023, designed for phased evacuation of the building. The equipment shall also comply with BS EN 54 and other local authority requirements that apply.

As a minimum,the control equipment shall comprise of;

- Emergency Microphones
- Paging Microphone
- Central Equipment Rack

The rack shall comprise of all amplification, audio matrix/router, fault monitoring, chargers and battery backup. The rack shall be fully tested, witnessed and certified prior to despatch from the manufacturer. On site, this rack shall be installed in the ground floor Comms room, which is a low fire hazard room where the ambient temperature does not exceed 23ºC.

Standby power for the system shall be provided and be capable of maintaining the system in operation for 24 hours in its quiescent state, followed by 30 minutes in full alarm condition.

The system shall also be utilised as a Public Address system, for general non-emergency announcements.

An Emergency Microphone shall be located adjacent to the Fire Alarm Panel at the main entrance to the building.

Another Emergency Microphone shall be located adjacent to the Fire Alarm Repeater Panel at the secondary entrance to the rear of the building.

Pre-recorded Evacuate and Alert messages, built into the rack, shall be automatically broadcast to all areas as directed by the Cause and Effect regime programmed into the Fire Alarm system.

A standard desk top paging microphone shall be provided at the Main Reception Desk.

Amplifier(s) shall be provided for each VAS zone and shall be sized to allow an additional 20% spare capacity.

Loudspeakers shall be selected to suit their environments with locations calculated to provide coverage with an even distribution of sound. Various types of loudspeaker will only be used to ensure compliance with the performance specification. The extent of the loudspeaker zones shall be in accordance with BS 5839-8:2023 and as detailed further in this specification. The Contractor shall allow for sufficient types and quantities of loudspeakers to ensure audibility and intelligibility levels meet the requisite performance throughout all areas.

Audibility and intelligibility of the system shall be in compliance with the requirements detailed in BS 5839-8:2023, sections 19 and 20.

Voice Evacuation Fire Strategy

Upon receipt of a trigger from the Fire Alarm system a pre-recorded Evacuate message shall be broadcast to the area of activation. Other zones shall only receive a pre-recorded Alert message as dictated by the Cause and Effect document.

These messages shall run continuously until reset by the Fire Alarm system, they shall only be interrupted in the event of announcements from the Emergency Microphones.

System Priorities

The highest priority is the Emergency Microphone adjacent to the main Fire Alarm Panel at the primary entrance to the building. This shall be wall mounted in a lockable enclosure. The unit shall comprise of a hand held microphone, with integral press to talk switch and zone select switches for live emergency paging. Status indication shall be provided on this unit. The VAS zones available from this unit are;

1. Basement
2. Ground Floor
3. First Floor
4. Second Floor
5. Third Floor
6. Fourth Floor
7. Fifth Floor
8. Sixth Floor
9. Seventh Floor
10. Stair Core 1
11. Stair Core 2

The second priority is the Emergency Microphone adjacent to the repeat Fire Alarm Panel at the secondary entrance to the building. This shall be wall mounted in a lockable enclosure. The unit shall comprise of a hand held microphone, with integral press to talk switch and zone select switches for live emergency paging. Status indication shall also be provided on this unit. The VAS zones available from this unit are;

1. Basement
2. Ground Floor
3. First Floor
4. Second Floor
5. Third Floor
6. Fourth Floor
7. Fifth Floor
8. Sixth Floor
9. Seventh Floor
10. Stair Core 1
11. Stair Core 2

The third priority shall be the fire alarm interface in the VAS rack, British Standard BS 5839-8:2023 requires that the interface connection is monitored by the fire detection panel.
For this system the fire alarm panel shall provide the following:-

- 12No. Alarm Addresses
- 1No. Common Fault Contact

The system proposed offers the following output messages for approval:-

- Evacuate - "Attention please, attention please, we have an emergency within the building, please leave by the nearest available exit"

- Alert - "Attention, attention, an incident has been reported within the building, please wait for further announcements"

Each message is preceded by 5 seconds of the appropriate attention drawing tone. Messages shall run until reset by the Fire Alarm system.

The fourth priority is the general paging microphone on the main Reception desk at the main entrance to the building. This shall have a gooseneck microphone, zone select switches, press to talk switch, pre-announcement chime facility and status indication. The paging zones available from this unit are;

1. Basement
2. Basement Gym
3. Ground Floor Circulation
4. Ground Floor Restaurant
5. First Floor Circulation
6. First Floor Staff Canteen
7. Second Floor
8. Third Floor
9. Fourth Floor
10. Fifth Floor
11. Sixth Floor
12. Seventh Floor

Standby Supplies

In determining the battery stand-by requirements, your calculations should be based on the premises being supervised at all times; for typical building applications this requires a 24-hour stand-by in the event of mains failure followed by half an hour in full alarm condition. Sports grounds may differ and the recommendations in BS 7827 and the Green Guide should be considered.

Design

The Contractor shall be responsible for developing the Voice Alarm/Public Address System in accordance with the supplied drawings, specification and the client's requirements.

The Voice Alarm/Public Address System shall be designed in accordance with the following British Standards, based upon the information outlined within this proposal.

- BS 5839-8:2023
- BS EN 54-4
- BS EN 54-16
- BS EN 54-24
- BS 6259:2015

Installation

All loudspeaker wiring shall be carried out using Enhanced Grade PH120 fire rated cables in compliance with current British Standards. Generally, cables shall have a minimum conductor size of 1.5mm and have an overall red LSF sheath. They will be fixed in a neat and tidy manner and secured with manufacturer's purpose made accessories.

Emergency Microphone wiring shall be carried out using Enhanced Grade PH120 fire rated cables in compliance with current British Standards. Generally, cables shall have an overall red LSF sheath and will be fixed in a neat and tidy manner and secured with manufacturer's purpose made accessories.

Paging microphone and 0dB line level wiring shall be carried out in LSOH/LSOH twisted pair(s), screened cable.

Microphone and 0dB line level cables are Category 2 and must be segregated from Category 1 circuits, as defined in BS7671 and in accordance with BS 6259:2015 section 7.6.2.

With reference to the 230V primary supplies, these shall be provided by the Electrical Contractor in compliance with BS7671 and BS5839-8:2023, Section 25.1.

On completion the Contractor shall issue an Installation Certificate, detailing the category of system, areas covered, and any variations from the original design certificate and specification.

Commissioning And Handover

The commissioning of the system shall be carried out in accordance with BS 5839-8:2023, Section 4.

On completion of the commissioning, the Contractor shall issue a Commissioning Certificate.

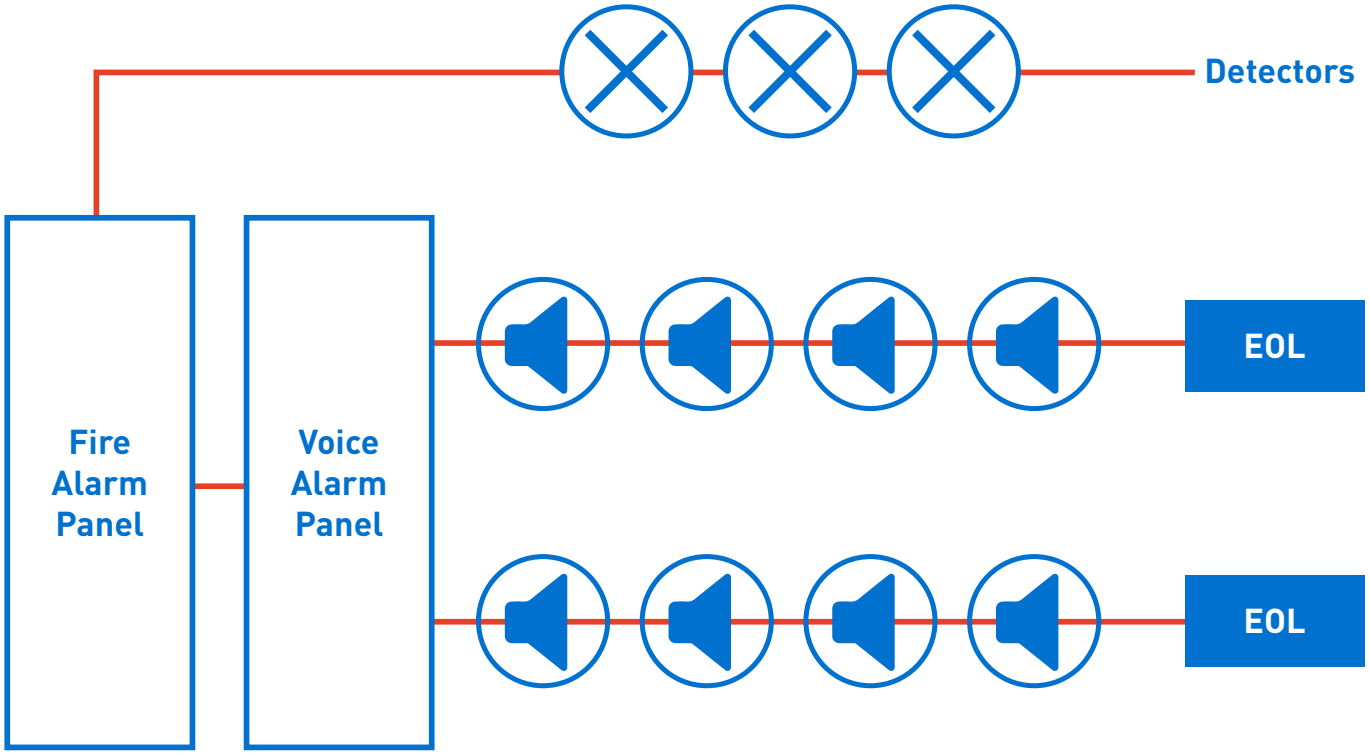
The Contractor shall produce all 'as fitted' documentation and issue a formal Acceptance Certificate to the Client for signature.

The Contractor shall make allowance to return to site 3 months after the building has been occupied, to 'balance' the system to suit the operational running of the building.

2.0 SYSTEM DRAWINGS

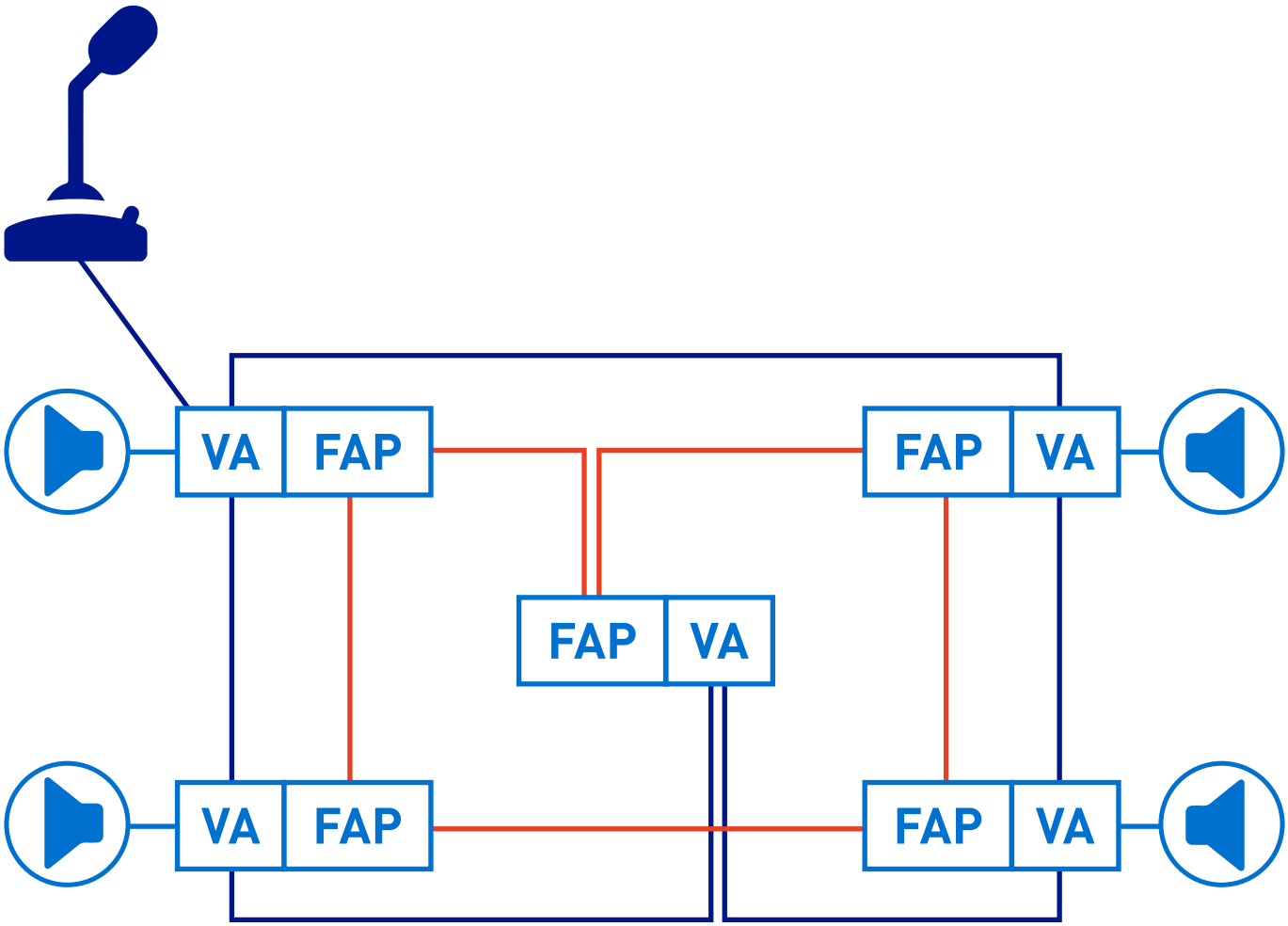
2.1 Typical Schematics

Centralised System



EOL = End of Line monitoring device

De-centralised System



VA = Voice Alarm
FAP = Fire Alarm Panel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