



Building Evacuation System (BES) MK XI

In emergency situations, the safety of personnel is the highest priority. They must be alerted immediately and evacuated from the danger areas. This function is provided by the Cavendish Nuclear General Alarm (GA) Evacuation System. As the alarm function uses distributed loudspeakers around the evacuation area it is common to add Public Address (PA) functionality to the General Alarm system, to provide a PAGA system.

The Cavendish Nuclear Public Address and General Alarm (PAGA) Building Evacuation System offers high reliability and the flexibility to meet the individual requirements of any nuclear plant, large or small.

The system is part of the proven CIDAS® criticality alarm evacuation system.

Features

- Low false alarm rate
- Zoned evacuation areas
- Single channel or dual redundant channel system
- Allows multiple Public Address stations
- Local and remote annunciator panels
- Customisable Audible and Visual alarms
- Radiation tolerance tested
- Warning lights to prevent re-entry to evacuated areas

- Optional Uninterruptible Power Supplies

Benefits

- Highly reliable building/area evacuation
- Designed for operation in harsh industrial situations
- Scalable design readily adapts to large or small facilities
- Complete turnkey package with lifetime service and support
- Can integrate with CIDAS® Criticality systems

The system can be supplied as either a simplex configuration (single channel) or duplex configuration (two channels – either of which will produce the alarm outputs). Optional hot spare systems are available.

Zoning can be used to accept inputs from sets of zones and provide alarms in the same or other sets of zones.

The BES can be configured to receive a digital alarm input signal from any sensor, switch or control panel.

Typically inputs are from:

- alpha/beta contamination monitors
- gamma area monitors
- criticality alarm systems
- gas, liquid or chemical sensing systems
- other alarm systems

Customisable visual and audible alarms are generated from the inputs. Different alarm tones can be configured for different inputs on a single system.

Alarms and Public Address are prioritised, so in the event of two inputs simultaneously the highest priority alarm always takes precedence.

Reliability

To ensure high reliability the system uses hardware logic with no software in the

alarm logic and circuits. It uses the same hardware as the highly reliable and plant proven CIDAS® criticality alarm system. The single channel system is designed to provide a reliability equivalent to BS EN 61508 SIL1, whereas the dual redundant channel system provides a reliability equivalent to BS EN 61508 SIL2.

The system employs a high degree of self-monitoring, including monitoring of loudspeaker and alarm lighting circuits, to ensure the system operates continuously.

Coupled with this the system provides a very low level of false alarm. Optional reliability and false alarm assessments of customer's exact plant configuration can be provided.

User Interface

The system allows multiple user access stations. These can be prioritised. User displays are provided on annunciators. Additionally the system can be extended to include Paging and Party line communications, including prerecorded messages.

Lifetime Support

Cavendish Nuclear works closely with customers to provide the most cost-effective and practical solutions, from system design through to project management, installation, system commissioning, operator training, and post installation maintenance and repair services.

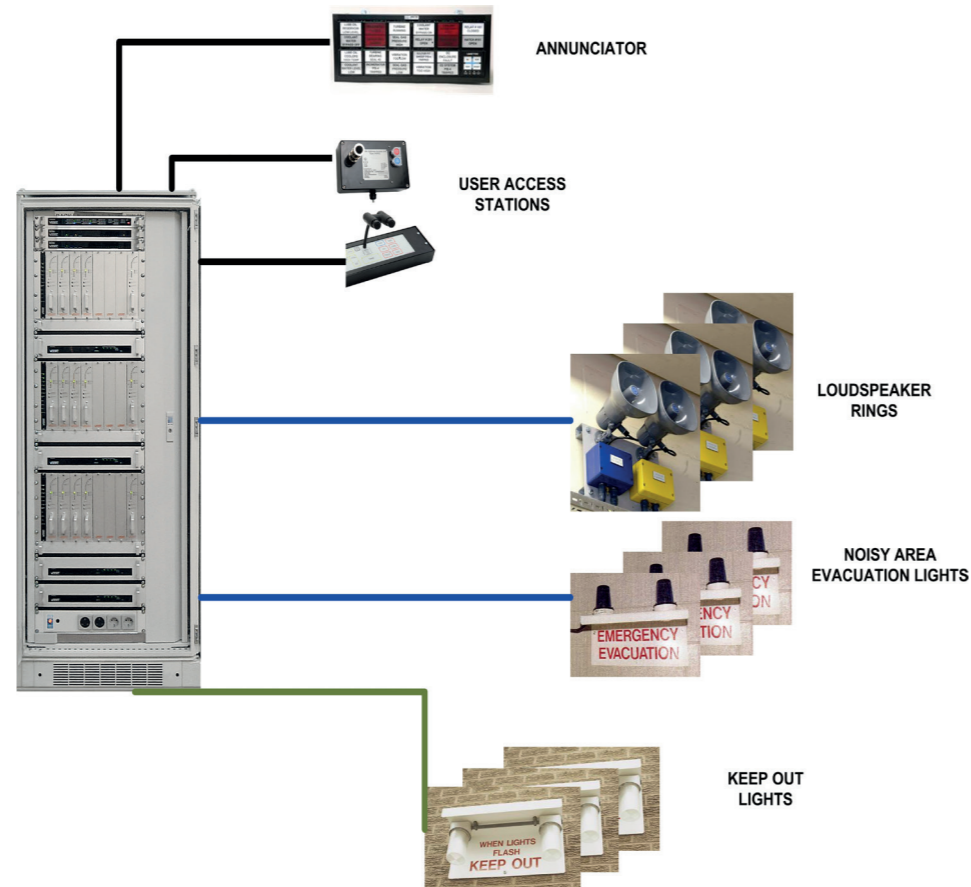
Cavendish Nuclear is committed to providing long term support to all users, providing the resources to ensure that installed systems remain fully functional at their optimum level throughout their lifetime.

Formal training courses are offered with the objective of enabling customers to provide front line maintenance and identification of faults. These training packages can be configured to meet individual needs.

For additional maintenance, repair and technical support Cavendish Nuclear offer bespoke packages to meet the technical and budgetary requirements of individual plants.

Uninterruptible Power Supplies (UPS)

Either 1 or 2 X 48V DC Uninterruptible Power Supplies can be provided to supply the internal electronics, detectors, sounders and beacons.



Building Evacuation System (BES) Mk XI System Schematic

Having a dual channel system means two UPS provide redundancy ensuring that if one UPS fails then there will still be power to all detection channels and one alarm channel.

The UPS can be configured to enable the BES to remain fully operation even with total loss of facility AC power. This ensures that voice /Alarm broadcasts can be made in emergency situations.

Beacons

The standard system is supplied with zero, one, two or three pairs of LED (or other types e.g. Xenon) beacons, located on separate rings. The beacons are installed remote to the panel.

The Standard BES system can drive around 40 alarm beacons (depending upon type). The standard BES can be modified to add more beacons if needed for very large facilities.

Speakers

The standard system is supplied with zero, one, two or three pairs of speakers located on two separate rings. The speakers are installed remote from the panel. The speakers have a minimum sound pressure level of 110dBA and a maximum sound pressure level of 120dBA at 1m, with custom tones available.

It is possible to connect several hundred pairs of loudspeakers to the standard BES, these can be located throughout the facility. The speakers can be zoned to provide selective PA or alarm broadcasts. The standard BES can be expanded to enable large PA / alarm coverage

Multiple BES systems in multiple locations can be interconnected over optical fibre links. This enables multiple buildings to have individual PA / alarm systems for local broadcast as well as site-wide broadcasts from a central location (e.g. control room).

Building Evacuation System (BES) Mk XI System Specifications

	System Enclosure	Amplifier	Speakers	Beacons
Operating Temperature	0°C to +40°C	0°C to +40°C	-25°C to +65°C	-50°C to +66°C
Relative Humidity	Up to 90% non-condensing	25 to 85% non condensing	90%	100%
Supply Voltage	48V DC Optional UPS	48V DC Unregulated	-	Mains or DC powered
Autonomy	8 hours quiescent / 10 minutes in alarm		-	-
Dimensions	1 Channel System: 2100mm height (including plinth) 800mm width 800mm depth 2 Channel System: 2100mm height (including plinth) 1600mm width 800mm depth	266mm height (6U) 50mm width 160mm depth	400mm length 320mm width 350mm depth	KOWLS: 700mm length 275mm height 250mm width NAWLS: 650mm length 469mm height 250mm width
Weight	1 Channel System: 225kg 2 Channel System: 425kg	2.5kg	10kg	10kg
Enclosure (IP) ingress protection rating (IEC/EN60529)	IP2X	IP2X	IP66	IP66
Audible Power	-	-	110 dB(A)	-

Summary

- Highly cost effective scalable solution
- Proven performance with high fault tolerance
- Flexible and expandable with zoning
- Low probability of spurious alarms

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