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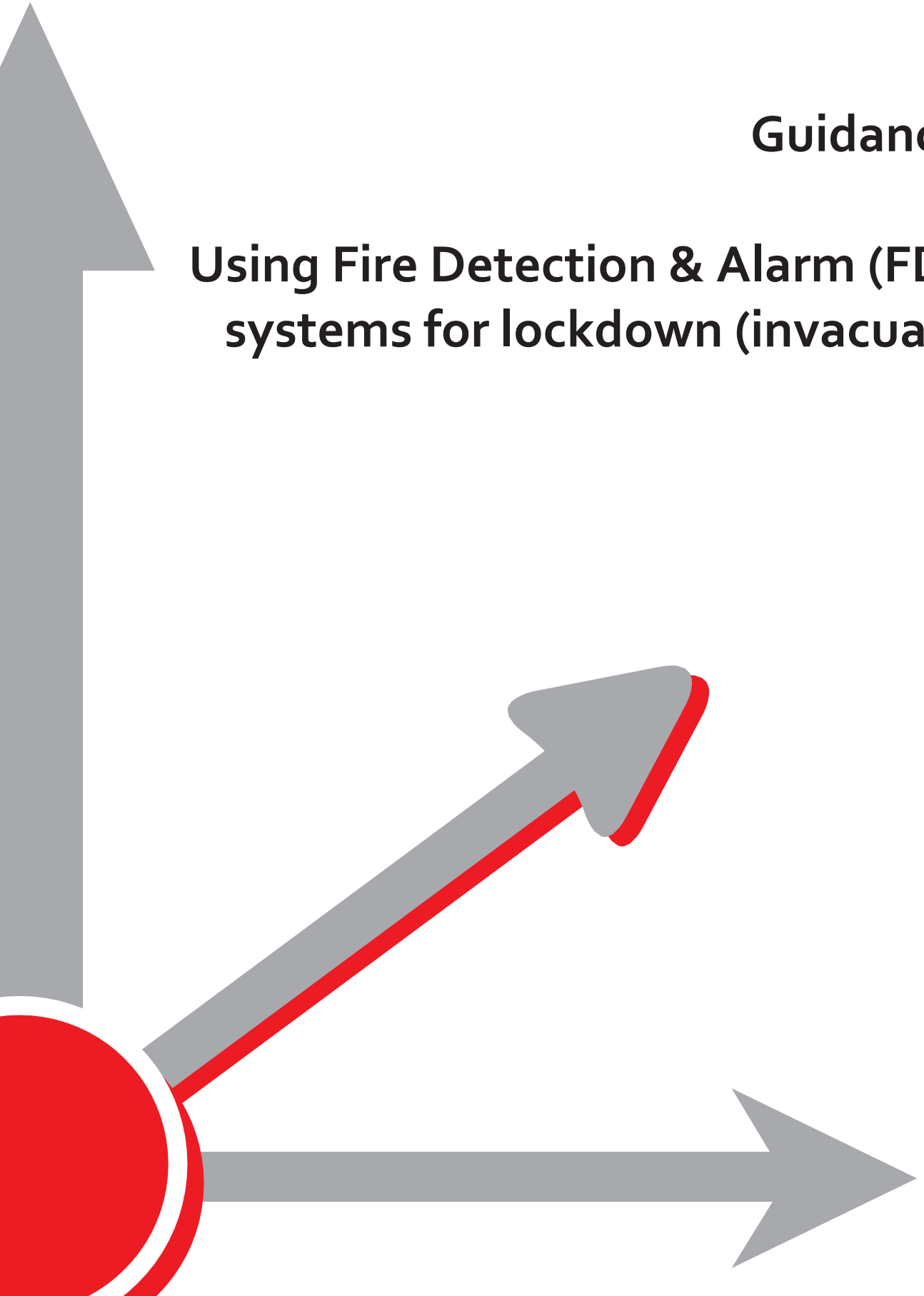
Guidance on

Using Fire Detection & Alarm (FD&A) systems for lockdown (invacuation)



Revision table

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FOREWORD

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Table of contents

1. Scope

This guidance explains how existing FD&A infrastructures can be used to support both traditional evacuation for fire and invacuation/lockdown for non-fire threats (e.g., intruder, violent incident, flooding, nearby external hazard), with emphasis on European practice, standards, and regulatory contexts. It is aimed at regulators, authorities having jurisdiction (AHJs), premises managers, designers, installers, and emergency planners across sectors (education, healthcare, critical infrastructure, corporate, public buildings). It does not prescribe a single operational plan; duty holders must risk-assess and define site-specific priorities and procedures, including the rare event of simultaneous fire and lockdown signals.

2. Regulation

2.1 European level

There is no harmonised EU regulation that mandates or prohibits the use of FD&A systems for lockdown/invacuation. Duty holders are expected to carry out a risk assessment and implement appropriate measures to keep occupants safe. Where FD&A infrastructure is used for additional (non-fire) warnings, the fire alarm evacuation signal must remain distinct and prioritised in accordance with national regulations to avoid confusion and ensure that proper balance between fire safety objectives and security objectives are not undermined[1].

[1] See: FIA (May 2025) Guidance Note — Use of FD&A for Lockdown (Schools)

European FD&A components remain governed by the EN 54 series (e.g., sounders, visual devices, control and indicating equipment, voice alarm control and indicating equipment (VACIE), loudspeakers, power supplies, and system compatibility). These standards define product performance, reliability and functional safety requirements for fire alarm and voice alarm equipment.

Where EN 54-compliant fire alarm and voice alarm infrastructure is also used to transmit non-fire emergency messages (e.g., security, invacuation/lockdown, or public safety messaging), such use shall not impair the required fire detection, transmission, warning or control functions, nor the availability and integrity of fire alarm signalling.

Fire evacuation signalling is normally treated as the highest-priority function within EN 54 voice alarm architectures. However, in integrated multi-hazard strategies, alternative prioritisation schemes (e.g., temporary override by specific security or life-safety messages, or manual live control during incident management) may be implemented where supported by risk assessment, national application standards, and approval by the competent authority.

Any such prioritisation shall be clearly defined in the system cause-and-effect strategy and shall ensure that fire alarm functionality remains continuously available, automatically restorable, and compliant with applicable EN 54 product standards and national fire safety regulations.

Key principle

Lockdown signalling can share FD&A infrastructure (for reliability, monitoring, and resilience) provided it uses distinct tones/messages and is engineered so fire functions and evacuation tones cannot be masked, delayed, or overridden. The UK's BS 5839-1:2025 now allows use of fire sounders for non-fire purposes with a different tone and clear cause-and-effect separation; this is illustrative of current best practice in Europe.

2.2 National levels (illustrative)

United Kingdom (application example)

BS 5839-1:2025 (application of FD&A systems): evacuation tones "should not be used" for non-fire purposes except where the response is identical to fire or (in schools) for class change ≤10 s. The 2025 edition permits using the same sounders with a different tone for invacuation/lockdown, without declaring a formal variation, provided cause-and-effect logic keeps fire functions independent and prioritised. While the standards allow for shared use of the fire alarm systems infrastructure there must be clear differentiation between the evacuation tone as well as dedicated and separate inputs/activation points (Blue call points/buttons to activate the alert are commonly used in the UK to differentiate from Fire/Red) without impinging on the fire alarm operation.

Germany (application example)

Fire alarm systems (Brandmeldeanlagen, BMA) are typically planned to DIN 14675-1 and DIN VDE 0833-1/-2; when adding an emergency and hazard response system (Notfall- und Gefahren-Reaktionssystem, NGRS) per VDE V 0827-1 to -3, designers should handle the "apparent conflict" between evacuation (fire) and lockdown (amok) conceptually. The solution is to define alarm cascades and a verification step, anchoring the chosen scenarios in the fire protection concept and the building permit for the particular building. The colour of the call point should be blue, and the lighting system should be blue.

France

In France, fire alarm and evacuation signalling are regulated through the Code de la Construction et de l'Habitation and the specific rules applicable to public-access buildings (Établissements Recevant du Public, ERP). Alarm equipment is governed by NF S 61-936, while the standardised evacuation signal is defined in NF S 32-001. These provisions focus almost exclusively on fire-related evacuation requirements, ensuring audibility, system reliability,

and integration within the building's safety system (SSI). Since December 2022, following the creation of the NFS61-942 standard, it's possible to integrate the lockdown alarm function into a fire alarm system. This standard admitted the use of the fire sounder with a specific tone (described in the standard), for the lockdown risk, provided that the cause-and-effect logic keeps fire function independent and prioritised. The colour of the call point should be black, and the lighting system should be blue.

Netherlands

The Netherlands has a well-defined national framework for both fire alarm and evacuation alarm installations. Fire detection systems are designed in accordance with NEN 2535, while evacuation alarm systems are governed by the NEN 2575 series. Notably, NEN 2575 specifies that evacuation alarm systems are intended for use "in case of fire or other emergencies," a formulation that includes scenarios such as bomb threats, gas leaks, or other hazardous situations. This explicit multi-hazard scope makes the Dutch framework a clear national example supporting the use of alarm infrastructure for both fire evacuation and non-fire emergency signalling. Silent alarm variants, covered in NEN 2575-4, further support tailored approaches in care facilities, theatres, and other complex environments. The Netherlands therefore provides a strong normative basis for integrated evacuation and invacuation/lockdown communication systems. The colour of the call point should be blue, and the lighting system should be blue.

Denmark

Denmark's approach to fire alarm systems is structured around the national building regulations and the technical guidance issued by the Danish Institute of Fire and Security Technology (DBI). Key references include DBI Guideline 232 for the design, installation, and maintenance of automatic fire alarm systems, and DBI Guideline 005 for operation and maintenance. These guidelines define requirements for performance, monitoring, fault handling, and user responsibilities. Their scope, however, remains centred on fire detection and evacuation-related functions. Current publicly available Danish guidance does not set out national rules for using fire alarm infrastructure for lockdown or invacuation signalling. As a result, any such use must be developed within the building's overall emergency concept and justified through risk assessment, ensuring that fire functions retain priority and are not adversely affected. The colour of the call point should be blue, and the lighting system should be blue.

Norway

Norway regulates fire alarm and voice alarm systems through the building technical regulation TEK17, supported by the national standards NS 3960 (fire alarm systems) and NS 3961 (voice alarm systems). TEK17 explicitly requires procedures for "fire and other situations that require evacuation," providing a regulatory foundation for broader emergency communication beyond fire scenarios. Voice alarm systems are recognised as suitable for conveying clear instructions in a variety of emergencies, and they can be integrated with both fire and security systems. Although Norwegian standards do not explicitly refer to "lockdown" as a formal category, the regulatory emphasis on multi-hazard preparedness and intelligible messaging provides flexibility for designing systems that combine evacuation and invacuation functions, provided that fire alarm priorities remain fully protected. The colour of the call point should be blue, and the lighting system should be blue.

Sweden

Sweden offers one of the most explicit national examples of integrating fire evacuation and lockdown/invacuation signalling within the same alarm infrastructure. The guidance published by SBSC states that evacuation alarm systems are intended to warn occupants "in the event of a fire or other danger," and actively recognises that an evacuation alarm/lockdown alarm may be implemented with spoken messages to direct occupant behaviour. In parallel, the Swedish Civil Contingencies Agency (MSB) provides guidance for managing violent intruder incidents

in educational settings, including evacuation (utrymning), invacuation (inrymning), and "locking out" external threats (utestängning). Together, these documents establish a clear national precedent for combining fire alarm infrastructure with broader emergency communication functions, supporting both evacuation and protective lockdown strategies. The colour of the call point should be blue, and the lighting system should be blue.

Switzerland

Fire alarm systems (Brandmeldeanlagen, BMA) using EN 54-3 devices are typically planned according to VKF-Richtlinie and SES-Richtlinie BMA. Adding an emergency and hazard response system (Notfall- und Gefahren-Reaktionssystem, NGRS) into the FD&A is not foreseen. It has to be a separate System with loudspeakers. Designers should handle the "apparent conflict" between evacuation (fire) and lockdown (amok) conceptually.

If an audio system is used, SES Richtlinie Voice Alarm Systems (SAA) & Electroacoustic Emergency Warning Systems (ENS) must be applied. In this application standard AMOK functionality is explicitly allowed and described, including priorities and planning considerations. The Audiosystems with safety requirements has to follow either EN 54-16 (BauprodukteGesetz BauPG) or EN50849.

2.3 Building codes

Across Europe, building regulations require that fire protection objectives (early detection, reliable alarm transmission to fire services if applicable, intelligible occupant warning, safe egress) are not compromised. Where invacuation/lockdown functions are added, they must be explicitly described in the fire protection concept (or equivalent) and agreed with the AHJ so that relative priorities and distinctive signalling are clear and enforceable. The German DKE material stresses making these scenarios part of the permit conditions and notes that dynamic/adaptive egress control may be appropriate in complex occupancies.

3. Procedures

3.1 Evacuation (fire)

The primary objective of the fire alarm system is to ensure that occupants are moved to a place of safety via the planned escape routes. Activation of the system must produce a dedicated fire evacuation signal, typically a distinct tone and, where provided, a corresponding voice message. This alarm must be clearly audible and/or visible throughout the areas defined in the building's fire protection concept. The system may operate automatically upon detection of fire conditions or be manually initiated via the fire detection and alarm (FD&A) control equipment. Upon activation, an immediate transmission of the alarm to the fire service should occur where this is required by the local regulations. On-site personnel must follow the established procedures set out in the fire safety plan and reinforced through regular drills. The design of the fire alarm system shall comply with the relevant national application standards—such as BS 5839-1 in the United Kingdom or DIN VDE 0833 in Germany—and with the component requirements of the EN 54 series, including EN 54-16 and EN 54-24 for voice alarm systems. The fire protection concept must also specify the areas where audible and visual alarms are necessary and describe the measures taken to ensure that vulnerable occupants receive timely and appropriate warning.

3.2 Invacuation / Lockdown (non-fire)

The objective of an invacuation or lockdown procedure is to protect occupants from external or internal threats by keeping them safely inside the building or within designated secure areas. Depending on the nature and proximity of the threat, this may range from a simple invacuation—where movement is restricted to safer internal spaces—to a full lockdown, during which rooms and zones are secured to prevent entry. The alarm system must produce a distinct signal that is clearly different from the fire evacuation tone, both in sound and, where applicable, in any accompanying visual or voice message. This ensures that occupants can immediately recognise the required action

and prevents confusion between conflicting emergency responses.

Activation of a lockdown may be triggered automatically by connected security systems or manually by authorised staff through dedicated controls. The system should be configured to deliver rapid and intelligible instructions, supported by short, unambiguous voice messages or visual indicators. A clear "all-clear" signal must also be defined to indicate when normal operation can safely resume. Procedures for staff and occupants should be described in the building's emergency response plan, with responsibilities assigned and rehearsed through regular drills.

Where the lockdown functionality is implemented using the existing fire detection and alarm infrastructure, the cause-and-effect logic must ensure complete independence from the fire evacuation function.

The design should comply with relevant national standards—such as DIN VDE 0833 in conjunction with VDE V 0827-1 to -3 for emergency and hazard response systems—and with the applicable EN 54 component standards. The overall emergency concept should define the communication methods, priority hierarchy, and provisions for occupants requiring special assistance, ensuring that both the fire and lockdown strategies work coherently within the approved fire protection concept and building permit.

3.3 Combined operation / conflicts of objectives

In certain emergency situations, the objectives of evacuation and lockdown may appear to conflict with one another. Fire safety procedures require occupants to leave the building quickly and follow designated escape routes, whereas lockdown procedures instruct them to remain inside and secure themselves against external or internal threats. In practice, this is not a contradiction but rather a conceptual and design challenge that must be resolved through careful planning and coordination. A well-prepared emergency concept defines the circumstances under which each response takes precedence and ensures that both systems—fire alarm and lockdown—operate in harmony rather than competition.

Fire evacuation signalling is normally treated as the highest-priority function within EN 54 voice alarm architectures. However, there are exceptional cases in which another threat, such as an armed attacker, chemical release, or nearby explosion risk, may require lockdown or invacuation to take temporary precedence. In these situations, the relative priority of signals must be clearly established in the emergency plan and reflected in the programming of the fire detection and alarm (FD&A) system. The logic within the control equipment must prevent a lower-priority signal from concealing or delaying a higher-priority alarm.

Where the potential for misuse of fire alarm devices exists—such as the deliberate activation of manual call points to trigger evacuation and expose people to danger—it may be appropriate to introduce a short verification period before the general evacuation signal is broadcast. This verification process should never delay the automatic transmission of an alarm to the fire service, and it must be explicitly documented and approved within the building's fire protection concept and permit.

In complex buildings, simultaneous or zoned responses may be necessary. For example, one part of the building may require evacuation due to fire, while another must remain under lockdown to isolate the threat and protect occupants. To support such scenarios, the system must be capable of zonal control with clearly defined cause-and-effect relationships, distinct audible and visual signals, and, where applicable, intelligible voice messages.

Ultimately, apparent conflicts between fire evacuation and lockdown objectives are best avoided by integrating both strategies at the design stage, involving fire safety engineers, security specialists, building operators, and the authorities having jurisdiction (AHJs). By embedding the agreed priorities and signal logic in the overall fire protection and emergency response concept, buildings can achieve a coherent, safe, and compliant balance between evacuation and lockdown requirements.

4. Possibilities (technology & integration patterns)

Modern building technology offers a range of possibilities for integrating lockdown or invacuation functions with existing fire detection and alarm (FD&A) systems. These possibilities extend from simple, stand-alone solutions to fully integrated emergency and hazard response systems that combine detection, communication, and control functions under a common management concept. The choice of approach depends on the building's use, risk profile, and regulatory framework, but in every case the integrity of fire safety functions must remain uncompromised.

At the simplest level, a lockdown warning may be provided through an independent system using dedicated sounders, public address devices, or local alert units. However, this approach often lacks the monitoring, redundancy, and reliability that are inherent in certified FD&A infrastructure. For this reason, many designers and operators seek to use existing fire alarm networks and components—such as sounders, loudspeakers, or voice alarm systems—to convey lockdown messages. This can be advantageous, as these systems already feature supervised wiring, secure power supply, and continuous self-monitoring, ensuring that the alert will function even in the event of a power failure.

When FD&A components are shared for non-fire purposes, their use must be carefully engineered and programmed in accordance with national regulations. The lockdown signal must be clearly distinguishable in tone, cadence, or voice message. Recent developments in European standards and national codes support this approach. For example, the BS 5839-1:2025 in the United Kingdom explicitly allows fire alarm sounders to be used for lockdown or invacuation signalling, provided a distinctly different tone is used and the cause-and-effect programming ensures that fire functions cannot be inhibited. Similarly, in Germany, the combination of a Brandmeldeanlage (BMA) in accordance with DIN VDE 0833 / DIN 14675 and an emergency and hazard response system (Notfall- und Gefahren-Reaktionssystem, NGRS) in accordance with VDE V 0827-1 to -3 is an established model for integrating multiple protective functions while maintaining clear separation of priorities and control paths.

Voice alarm and public address (VA/PA) systems provide additional flexibility by enabling dynamic and intelligible messaging. These systems can deliver pre-recorded or live instructions, switch between evacuation and invacuation modes, and adapt messaging to individual zones or building sections. When used for both purposes, the VA/PA system must comply with EN 54-16 (control and indicating equipment for voice alarm) and EN 54-24 (loudspeakers), and the design must ensure sufficient sound pressure level, intelligibility, and redundancy across all relevant areas.

Integration with other building systems—such as access control, building management, and security surveillance—can further enhance situational awareness and coordinated response. For example, a lockdown signal may trigger automatic door-locking sequences, disable turnstiles, or send alerts to staff communication devices, while the fire alarm retains authority to override these measures where safe evacuation is necessary.

Although American guidance documents, such as NEMA SB 40, are not directly applicable within Europe, they provide useful non-normative reference points, particularly regarding risk assessment methodologies, intelligibility criteria, priority control, and electrical supervision. When adapted to European standards and regulatory structures, these principles support the same overarching goal: a resilient, intelligible, and interoperable emergency communication system.

5. Design & engineering guidance

The successful integration of lockdown or invacuation functions into a fire detection and alarm (FD&A) system depends on a rigorous and well-documented design process. This process must begin with a comprehensive risk assessment and continue through detailed engineering, commissioning, and maintenance. Each stage should

demonstrate that the integrity of fire safety is preserved, that the system's operation is intuitive and reliable under stress, and that all emergency procedures—whether evacuation or lockdown—are clearly supported by the technical design. The following guidance outlines the key engineering principles, design considerations, and operational safeguards required to achieve a compliant, resilient, and coordinated emergency communication system.

1. Start with risk and an integrated concept
   Form a multi-disciplinary team (owner, security, safety, fire engineer, IT/OT, installers, users). Document threats (fire, intruder, external hazards), decide countermeasures (evacuate, invacuate/lockdown, reverse evacuation), and define alarm priorities and communications plans (on-site and off-site). Maintain these in a living Technical Risk/Management File and the fire protection concept.

2. Signal distinctiveness & human factors
   - Use distinct tones and phrasing and avoid reusing the fire tone for non-fire events. Provide 'all-clear' messaging.
   - Ensure audio intelligibility through correct loudspeaker selection/placement, levels above ambient, and distribution; supplement with visual messaging for accessibility.

3. Priority & interoperability
   - Fire evacuation must pre-empt routine audio and non-critical signals.
   - If multiple systems are used (FD&A, PA/VA, security comms), ensure monitored interfaces, documented priorities, and fail-safe behaviour, so that no interface can degrade fire safety functions.

4. Cause-and-effect programming
   - Keep fire detection/evacuation logic independent from lockdown logic.
   - Implement clear zone-based messaging enabling partial evacuation/invacuation.
   - Where a verification window is adopted (e.g., for MCP activations in high-risk sites), ensure external fire transmission is immediate, the window is short, and trained staff and intercom are prepared to confirm the situation; codify this in the permit.

5. Physical protection & cyber/IT considerations
   - Protect critical equipment, controls, and field devices from tampering; consider vandal- and weather-resistant devices for exposed areas. Supervise critical lines and endpoints.
   - If using IP networks for VA or messaging, segregate life-safety traffic (e.g., VLANs), provide secondary power to network switches/edge devices as appropriate, and maintain security baselines.

6. Power supply and survivability
   Apply the same secondary power principles to any lockdown/PA paths that carry life-safety messaging, equivalent to fire paths where those are shared. Avoid sharing critical circuits with non-emergency loads.

7. Inspection, testing, and maintenance
   - Exercise shared components routinely (daily/weekly use improves readiness).
   - Where functions are infrequently used (e.g., lockdown messages), apply electrical supervision, routine functional tests, and documented periodic drills. Keep as-built C&E, O&M manuals, and software under configuration control.

6. Sector Notes

Different building types and user groups face distinct threat profiles, operational constraints, and regulatory expectations. As a result, the integration of lockdown or invacuation functions into fire detection and alarm systems must be adapted to the characteristics of each sector. The following notes highlight key considerations for education, healthcare, critical infrastructure, and public buildings, illustrating how the general principles outlined in this guidance translate into sector-specific practice.

- In the **education sector**, particularly in schools and universities, emergency planning must recognise that children, students, and staff may be spread across classrooms, corridors, sports facilities, and outdoor areas. Lockdown procedures therefore typically distinguish between partial and full lockdown, ensuring that occupants can quickly move to safer internal spaces or secure rooms when required. Systems must provide clear, intelligible alerts in all teaching and communal areas, and many facilities benefit from two-way communication options that allow staff to report their status or request assistance. As many schools already conduct regular fire drills, incorporating lockdown exercises into the safety programme helps ensure that both staff and learners are familiar with the appropriate responses. Increasing attention to protective security in the educational environment further reinforces the need for reliable signalling and well-defined procedures.
- In **healthcare facilities**, emergency planning must accommodate vulnerable occupants who may be unable to evacuate quickly or independently. Hospitals, clinics, and long-term care environments often employ defend-in-place strategies for certain fire scenarios, supported by compartmentation and controlled patient movement. When lockdown measures are introduced, they must be carefully coordinated with clinical operations, access control, and emergency services access routes. Integration with security systems—such as controlled doors and staff communication tools—can support rapid protective actions, but any automated restrictions must still permit safe and compliant evacuation when a fire signal takes precedence.
- **Critical infrastructure and public buildings** face a broader range of potential hazards and typically accommodate large, diverse populations. In transport hubs, cultural venues, administrative buildings, or commercial complexes, emergency communication must reach both staff and transient visitors who may be unfamiliar with the environment. Lockdown or invacuation measures may need to be applied only to specific zones while others remain in evacuation mode, requiring precise cause-and-effect logic, zonal voice messaging, and clear priority rules. Coordination with security measures—such as crowd management, access restrictions, and liaison with first responders—is essential to ensuring that both fire and security objectives can be achieved without introducing conflicting instructions.

Across all sectors, the overriding requirement is that the chosen strategy reflects the specific operational context, user needs, and regulatory obligations of the building. Tailoring the emergency communication system to these realities ensures that evacuation and lockdown procedures are both feasible and effective when implemented under real-world conditions.

7. Implementation checklist

Translating an emergency strategy into a safe and legally robust installation requires more than technical design alone; it demands clear documentation, defined responsibilities, and transparent agreements with the authorities having jurisdiction. The implementation checklist serves as a practical tool to ensure that every critical element of the fire-evacuation and lockdown concept is captured, validated, and formally integrated into the building's safety documentation and permit process. By systematically working through these items, stakeholders can verify that the system's configuration, operational procedures, and technical interfaces align with national regulations, recognised standards, and the approved fire protection concept. This structured approach helps to avoid ambiguities, ensures enforceability, and supports long-term operational reliability throughout the life of the building.

- ✓ Risk assessment identifies invacuation/lockdown use cases and stakeholders; communications to off-site entities (police, fire, parents, community) are planned.

- ✓ Distinct signals: fire vs. invacuation/lockdown (tones, voice, visuals) defined; all-clear defined.

- ✓ Priorities: documented relative priorities; in application guidance (e.g., UK), ensure higher-priority alarms can't be hidden by lower-priority ones.

- ✓ Cause-and-effect: independent fire vs. lockdown logic; support partial and simultaneous modes; any verification window agreed with AHJ and embedded in the permit.

- ✓ Hardware/paths: shared components (sounders, loudspeakers, controllers, links) sized and supervised; secondary power provisioned consistently.

- ✓ Interfaces: monitored, fail-safe, and do not inhibit fire performance; routine comms cannot block emergency takeover.

- ✓ Documentation: as-built drawings, O&M, software/version control, testing schedules, and training/drill records kept current for the life of the facility.

- ✓ Training & drills: roles and exercises for both fire and lockdown; lessons logged to update the concept ("living document").

8. Conclusion

The use of fire detection and alarm (FD&A) systems to support both evacuation and lockdown functions is increasingly recognised across Europe and beyond as a practical and effective approach to managing diverse emergency scenarios. While national regulations and standards differ in emphasis, a consistent pattern emerges: fire safety functions must remain paramount, signalling must be clearly distinguishable, and all emergency procedures must be embedded in a coherent, building-specific concept agreed with the authorities having jurisdiction.

Several countries now provide regulatory or normative touchpoints that support multi-hazard use of alarm and voice systems. Examples range from explicit references to "other dangers" and lockdown-type alarms in Nordic guidance, to Dutch norms that allow evacuation signalling for fire and other emergencies, and national frameworks such as those in France, Germany, the United Kingdom, and Norway that can accommodate integrated approaches through appropriate design, verification, and documentation. As further national snapshots are added, the picture becomes clearer: the trend across Europe is moving towards integrated, resilient communication systems capable of supporting a wider set of protective actions.

The shared lesson from all jurisdictions is that technical integration alone is not sufficient. Effective multi-hazard alarming requires early collaboration between fire safety engineers, security specialists, building operators, and regulators; rigorous cause-and-effect design; and operational planning that considers real-world human behaviour under stress. When these elements are aligned, FD&A systems can reliably deliver both evacuation and invacuation/lockdown instructions without compromising compliance or life-safety performance.

This guidance therefore provides a harmonised framework for applying best practice across a diverse regulatory landscape. By grounding multi-hazard alarm strategies in clear priorities, compliant system design, and robust documentation, stakeholders can create emergency communication systems that are both technically sound and operationally effective—now and as additional national guidance becomes available.

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