

Fact Sheet

Increase fire safety by understanding false alarms

In the case of hazard warnings, it is possible that there are no signs of this hazard at the suspected location of the event. Such cases are also indicated as "false alarms". They occur in diverse environments and in connection with different procedures and technologies (e.g. in the early detection of tsunamis, in personal scanners at airports, in intrusion detection system, in disease diagnostics and in the broader sense in journalism and politics).

In fire protection, false alarms occur in all alarm paths and are often discussed in the context of installed fire detection and fire alarm systems.

Definition: False alarm

A false alarm is defined as a fire alarm when there are no conditions that justify a fire intervention.

Notes:

- The alarm is not classified as a real fire alarm; a fire intervention is unjustified.
- In some countries the term „false (fire) alarm“ is used as unjustified, unwanted and untimely alarm or as a subcategory (e. g. Denmark: False alarm as an intentional alarm and blind alarm as an unintentional alarm or Switzerland: False alarm as an unwanted, intentional alarm, in Sweden: A false alarm is used as an intentional alarm).

False alarms are divided into the following main categories:

- a. equipment false alarms or technical failures,
- b. deceptive false alarms and
- c. malicious and good intent false alarms

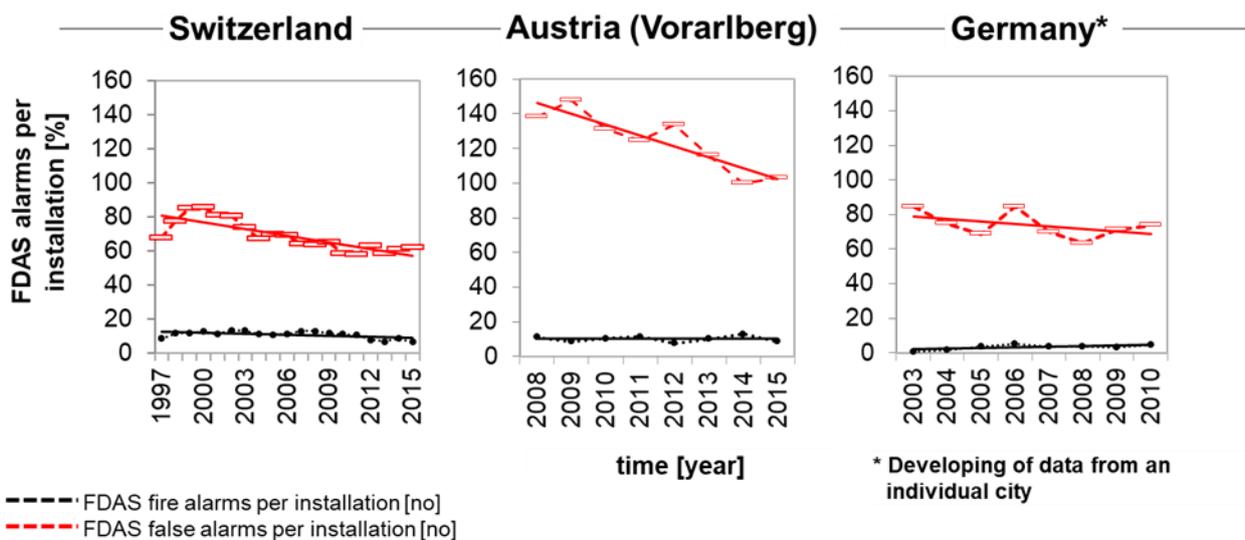


Fig. 1: Overview of FDAS alarms per installations in Switzerland, Austria and Germany: The ratio is declining in the last years (**Note:** In the countries, there are slightly different definitions in detail).

For some years now, the ratio of false alarms related to the number of installations have been reduced by installed fire detection and fire alarm systems through a number of available measures. Most false alarms today are triggered by deceptive alarms. In this case, the systems operate as intended and are triggered by fire-like phenomena through chemical-physical parameters (e.g. vapour and dust). This group of false alarms is to a large extent a consequence of decisions and actions taken (or not taken) by people in the planning, installation, operation and maintenance of systems.

For this reason, the following already known measures to avoid false alarms are presented in this Fact Sheet. By implementing these measures, the false alarm ratios can be reduced.

Measures to reduce false alarms

As already mentioned, false alarms are not only fraught with dangers. If they are to be prevented nevertheless, some approaches are well known in the different countries analyzed:

Products

- Usage of high quality products (e.g. CE marked and certified by a notified body, or fulfills optional and increased product requirements)
- Using optimized algorithms

Planning

- Exemption from scope of FDAS as a last resort and only after consultation with the relevant authority
- Prevention of unfavorable effects like: electromagnetic radiation, induction currents through cable lines close to conductors which carry lightning currents or close to electrical cables, air movement from e.g. air conditioners, creation of parameters of fire-like phenomena through operational processes, vibrations, weather influences like condensate formation, solar irradiation, dust, gases and water vapor, biological influences like micro-organisms and insects
- Consideration of suitable detector sensitivity settings
- Using a suitable measuring principle for the detector depending on the place of installation
- Performance monitoring of newly commissioned systems
- Positioning and selection of suitable products according to the place of installation of the detector (e.g. manual call points, automatic fire detectors)
- Further integration of the topic of false alarms into the concepts of FDAS and fire safety

Organization

- Carry out inspections after work that could cause combustion
- Comprehensive instruction of employees on the topic of fire Safety, FDAS and false alarms
- Deactivating the FDAS before work is carried out that may trigger deceptive alarms (e.g. building works, cleaning, maintenance)
- Employing at least one person on-site who is trained in handling the FDAS
- Engage well-trained and qualified (certified) providers to design, install and maintain the system
- Implementing a pre-alarm sequence
- Inform building operators and users, tenants, contractors, maintenance companies, fire services and police about the mode of operation of FDAS (raise general awareness)
- Informing external companies about the existence of fire detection equipment
- Intensify the cooperation between fire services, building owners and insurance companies to optimize the alarm process and information exchange (cf. [56])
- Provide feedback and possible corrective measures to the owner after a false alarm event
- Providing sufficient resources to organize operational fire protection
- Use of pre-transmission confirmation, which also promotes a fast, early on-site intervention against the fire
- Using the dual-detector dependency:
 - Type A; Following the first alarm signal of a fire detector, the FDAS delays the alarm condition until confirmation of an alarm signal from the same fire detector, or another detector in the same zone (In the past: "intermediate alarm storage")
 - Type B; Following the first alarm signal of a fire detector, the FDAS delays the alarm condition until confirmation of an alarm signal from a fire detector of the same or another zone (In the past: "dual-zone dependency or two-detector dependency")

Maintenance

- Adjustment of detectors when use changes
- Change and modernization of installations (regular check of the soiling of fire detectors)
- Consideration of additions and changes to existing standards, guidelines and recommendations as well as new regulations
- Consideration of products and application standards throughout the entire lifecycle (compliance with Fire Protection Code)
- Immediate resolution of faults in the FDAS
- Maintaining a log book with alarms, faults and operation modes for analysis of the alarm logs and to investigate the exact cause of the alarm to prevent repetition (updating the contact person in the datasheet)
- Monitor false alarms and advise on targets given the number of false alarms per 100 detectors per annum for different applications
- Owners/operators of FDAS take measures against false alarms to avoid penalties from the municipalities (charge internal and external costs to initiator)
- Regular servicing and maintenance, including the periodic check of the functionality of the FDAS
- Review detector type and settings with change of room use or geometry
- Inspection at delivery and periodic inspections thereafter, annually by trained 3rd party inspectors. This also contributes to better performing systems

Conclusion

The control of false alarms is facing several challenges, such as raising awareness for appropriate planning and application of fire detection and fire alarm systems. But also the different definitions and detection methods of such events, different activation conditions and technical application standards are part of it. Today, the majority of false alarms of installed fire detection and fire alarm systems are due to deceptive false alarms caused by steam and dust. Modern high quality technologies, application rules and maintenances are able to decrease the number of false alarms significantly.

Due to the nature of any alarming path and detection system in general, there is always a chance that false alarms are introduced. Therefore, false alarms are not uncommon. There is a whole range of strategies to reduce them further. The industry is continuously working on improvements to reduce false alarms. The measures are not only technical issues. An holistic approach is required to integrate the activities of system owners and other stakeholders against false alarms.

About Euralarm

Euralarm represents the fire safety and security industry, providing leadership and expertise for industry, market, policy makers and standards bodies. Our members make society safer and secure through systems and services for fire detection and extinguishing, intrusion detection, access control, video monitoring, alarm transmission and alarm receiving centres. Founded in 1970, Euralarm represents over 5000 companies within the fire safety and security industry valued at 67 billion Euros. Euralarm members are national associations and individual companies from across Europe.

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Note: The English version of this document is the approved Euralarm reference document.

Festag, S. et al. (2018). *False Alarm Study: False Alarm Data Collection and Analysis from Fire Detection and Fire Alarm Systems in Selected European Countries*. Berlin: Erich Schmidt Verlag.

Festag, S. (2016). *False Alarm ratio of Fire Detection and Fire Alarm Systems in Germany – A meta Analysis*. *Fire Safety Journal*, 79, 119-126. doi:10.1016/j.firesaf.2015.11.010)