A NEW ERA OF DIGITISED MAINTENANCE FOR FIRE AND LIFE SAFETY SYSTEMS

Installing and maintaining life safety systems in compliance with a building's occupancy type is required by fire codes and follows legal requirements globally.

Once a building owner installs a new life safety system, proof must be filed with the local fire authority that the system has been designed to the local code of practice and that it is working as intended. At prescribed intervals during the life-cycle of the installed fire system, it will require testing, inspection, and maintenance to confirm that it continues to work well for the building and those who occupy it. For example, smoke detectors are generally required to be functionally tested and inspected annually.

Historically, processes relating to the provision of life safety Test and Inspection have been manual. Digitising these processes can help service providers and building owners in many ways, including saving time on site, reducing building disruption, providing real-time updates on Test and Inspect progress, and improving life safety performance by validating that the entire system works as intended and has been tested to code.

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WHAT HAS CHANGED IN THE LIFE SAFETY SYSTEM INDUSTRY?

As the world around us has become increasingly connected and automated using new Internet of Things (IoT) technologies, using connected devices and apps in fields ranging from banking to home appliances has become second nature. Life safety is no different.

The expectation to manage and control building systems, including the fire system, using a mobile device is growing. Fire code enforcement authorities have also benefited from 'going digital' and some regions have implemented electronic compliance reports.

Many life safety system manufacturers and Test and Inspect app providers have introduced connected features enabling remote status updates, and in some applications, controlling and even automating processes anytime or anywhere using connected software.

In the context of the last few years, COVID-19 prevention efforts accelerated the pre-pandemic trend of automating Test and Inspect processes to ensure engineers on site are there for a shorter amount of time, with the added intent of being less invasive and manage occupancy levels in sensitive areas of the hospital. Furthermore, as service providers are finding it difficult to hire and retain skilled labour, there is even more focus on ways to speed up and improve the Test and Inspect compliance process.

IMPROVING LIFE SAFETY

Why is the proper maintenance of fire and life safety systems so important? According to a Fire Safe Europe report[1], every day in Europe alone there are, on average, 5,000 fires, 11 lives lost, and 190 hospitalisations due to building fires. Total GDP impacted is 1% from building fires and, in the UK alone, 5,000 full-time jobs are lost each year due to warehouse fires. There is an environmental impact, too. A Swedish study[2] showed that Carbon Monoxide (CO) created by unburned particles from building fires was greater than the CO emissions from commercial transport.

More advanced digitised maintenance such as automation can help to uncover hidden issues that are often missed with manual processes, such as covered detectors. Some detectors can remain covered for years, especially if they are placed in ceiling in voids and hard to reach areas. These issues can lead to tragic events such as a real case in the UK, where a fire occurred in a community housing association[3] property leading to the death of an elderly resident. The coroner confirmed that this fire was not detected quickly enough as the dust covers were still in place.

All app-based Test and Inspect processes help to support the effective and provable maintenance of fire alarm systems. Thorough maintenance processes help to uncover issues that might prevent fires being detected and located, which can lead to property damage, work disruption, environmental impact and, most importantly, loss of life.

SAVING YOU TIME

Manual inspection processes are time consuming and cause disruption to building occupants whilst testing is underway. Testing smoke detectors manually represents about 70%-80% of the time needed to inspect an average fire detection system. All app-based process are designed to improve engineer efficiency and accuracy. The least intrusive automated processes can mean that maintenance inspection can now be done during normal working hours, as opposed to being supported on evenings or weekends.

Manual test report creation can take days to complete, yet as app-based testing is stored digitally, report generation to specific to code compliant templates can now be done in seconds.

PROVING COMPLIANCE

Professional life safety Test and Inspect service providers strive to do a thorough and accurate inspection; however, evidence demonstrates the limitations of relying on manual Test and Inspect processes, 'the word' of a poor service provider or the negligence of a building owner.

- Approximately 70% of automatic fire alarm systems in Danish companies and public institutions are faulty when they are inspected[5]
- A restaurant director was sent to prison because the fire alarm system had been turned off which led to a huge fire going undetected[6]
- An "indecipherable message" on the fire alarm control panel leading to the wrong part of the Notre Dame cathedral being inspected after a fire[7]

We are no longer required to blindly trust that life safety systems are inspected, tested, and maintained accurately. With digital Test and Inspect compliance reports, now you can prove it.

WHAT ARE THE LEVELS OF CONNECTED TEST AND INSPECT?

1 LEVEL DIGITAL TEST AND INSPECT

Level 1 digital Test and Inspect processes allow the recording of inspection routines via a mobile app using device-specific inspection and testing forms. As Test and Inspect activities are passed or failed, the data results are logged and saved for configuration into reporting templates specified by the local authority. For additional security, they can also be stored in the cloud.

2 LEVEL CONNECTED DIGITAL TEST AND INSPECT

Connected Test and Inspect allows direct connection to the fire alarm control panel through a connected gateway or communicator, which helps to ensure greater testing accuracy.

Connected Remote Command and Control and Event Monitoring

With the app connecting to the fire panel remotely, it is possible to monitor and control fire system events and (with key safety controls in place). Facilities managers and service providers benefit from real-time system event status, allowing them to view fire events or failures with swift remedial action. The support engineer can also perform functions such as acknowledge, silence, reset, enable, and disable within the Test and Inspect app allowing faster customer support.

Addressable Fire Panel Data Import into Connected Test and Inspect App

Level 2 connection provides the ability to fetch detailed device data from the fire panel, which means any Test and Inspect inspection plan accurately represents all devices stored in the panel, so nothing is missed. Imported data can include detector sensitivity metrics, addresses, serial numbers, device age, event history and other information to support the maintenance provider in delivering accurate supporting information around the health of the system and guidance on any potential remedial work. Importantly, it also allows the engineer to amend and update inaccurate system information, such as device labels, as they go through the building carrying out maintenance inspections.

Alarm Test Signal Verification from Compatible Fire Panel to Connected Test and Inspect App

As the maintenance engineer tests the addressable devices, the fire panel picks up the test signal and automatically passes the test acknowledgement back to the mobile Test and Inspect app, meaning the engineer receives instant feedback of a successful test before they move to the next device. Additionally, they can pick up any other fire events, including real events, directly to their mobile app allowing them carry out a maintenance inspection without needing have a second engineer back at the panel. This process helps provide indisputable evidence as to what has been tested.

3 LEVEL AUTOMATED CONNECTED 'SELF-TEST' TEST AND INSPECT

Self-Test detectors, which automatically perform a functional test of the detector using a mobile app, provide a new level of efficient, accurate, and validated Test and Inspect results. Code compliant Self-Test detectors are designed to generate a small amount of smoke to test the optical smoke chamber and then measure the smoke dilution speed to prove the detection chamber's smoke entry points are clear from obstruction. A built-in heat generator also verifies any heat detector response, which can often go untested in multi-criteria detectors. Some smoke detectors incorporate Bluetooth compatibility which allows the engineer to validate they have been within visual inspection range of the device when carrying out the visual inspection. When in Bluetooth range of the detector, the device information is communicated directly to the Test and Inspect app so the engineer can easily validate device's address and label.

A Self-Test detector eliminates the need for a technician to carry a smoke pole, heat pole, step ladders and toolkit around the building to perform functional testing. Additionally, a self-test detector mitigates the risk of an engineer applying too much aerosol test spray, which can leave a detector in a pre-alarm condition for an extended period. It is important to note that the detector magnet test, or software driven verification tests, do not meet the requirements of a functional smoke detector test and is rejected by nearly all codes of practice.

THE BOTTOM LINE

Fire continues to be a significant risk and Allianz reported that fires and explosions were the number one cause of losses for businesses worldwide over a five-year period. Consequently, local authorities are continuously seeking ways to ensure building owners, facility managers, and other responsible parties are in complete compliance with the appropriate building life safety codes. It is not uncommon for a fire official to pay an unannounced visit to review compliance reports and life safety standards in a building. Paper-based compliance report storage is time consuming to manage and prone to errors. A digital, or automated Test and Inspect solution, takes proving building code compliance to new levels by providing undisputable evidence that a system was correctly tested and inspected, and that any required system improvements have been completed.

SOURCES:

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