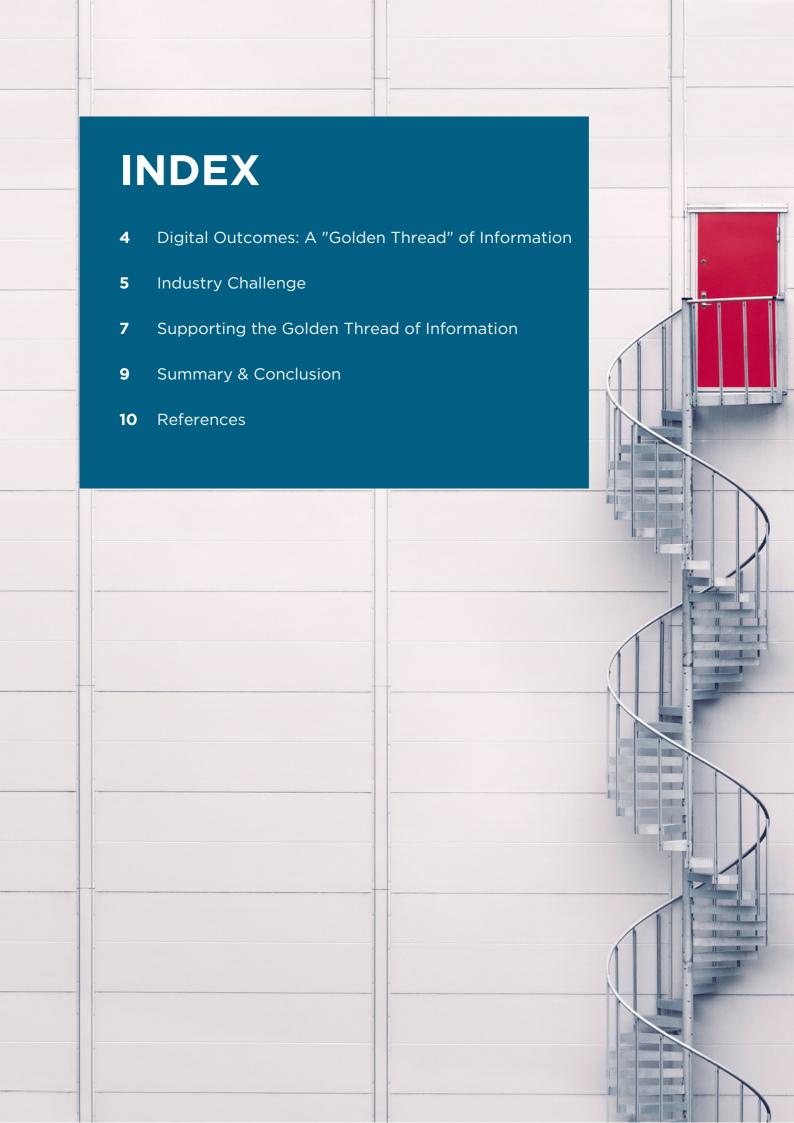# DIGITAL FIRE SAFETY REQUIREMENTS

SYMETRI'S GUIDE

On the digital requirements of the Building & Fire Safety Acts, and the BS8644-1 Digital Management of Fire Safety Information Standard

INDEX

WHY READ THIS WHITEPAPER?

Just before 1.00am on the 14th of June 2017, a fire broke out in the kitchen of a fourth floor flat at the 23 storey Grenfell tower block in North Kensington, West London, leading to one of the UK's most tragic and worst disasters of modern times.

The fire was started by a faulty fridge-freezer on the fourth floor. It spread rapidly up the building's exterior, bringing fire and smoke to all the residential floors. It is understood that the fire set light to the flammable exterior cladding through the gaps around the flat windows.

Within minutes, the fire had raced up the exterior of the building and then spread to all four sides. By 03:00am, most of the upper floors were well alight. Seventy-two people lost their lives, and hundreds were left homeless as a result of the fire.

As a result of the tragedy, the Grenfell Tower Inquiry was set up. Phase 1 was issued in October 2019 concluding in Chapter 26, "there was compelling evidence that the external walls of the building failed to comply with Requirement B4 (1) of Schedule 1 to the Building Regulations 2010". Phase 1 of the Grenfell Tower Inquiry concluded that the building's exterior did not comply with regulations and was the central reason why the fire spread. Phase 2 of the inquiry is still ongoing.

In parallel with the Inquiry in September 2017, as part of the Government's response, the government commissioned Dame Judith Hackitt to review the Building Regulations and Fire Safety Act and in particular, their impact on Fire Safety.

Now known as the Hackitt report, the recommendations were wide and far reaching. In December 2018, the Government undertook to implement the report in full.

From these recommendations, a new fire safety act was introduced in April 2021 and the government published the Golden Thread Report in July 2021. These form a subset of the UK government's Building Safety Bill which In April 2022, received Royal Assent making it the Building Safety Act and a new British Standard code of conduct 'BS8644-1 Digital management of fire safety information', which was published on 29th July 2022.

In this whitepaper, we look at the digital implications of the report's recommendations.

DIGITAL OUTCOMES

A "GOLDEN THREAD" OF INFORMATION

Dame Judith recommended the introduction of a digital 'golden thread' of information as a tool to manage buildings as holistic systems and allow people to use information to safely and effectively design, construct and operate their buildings. Within the Golden Thread report published by the Government, the report specifies that the golden thread will:

- Use digital tools and systems to enable key information to be stored and used effectively to ensure safer buildings.
- Make information easily available to the right people at the right time.
- Incorporate all the information needed to understand a building and how it should be managed so that the building and above all, the people in and around a building, are safe both now and in the future.
- Put in place a new higher standard of information-keeping which will support the building safety regulator in being assured that buildings are being managed safely.
- Support duty holders and accountable persons throughout the life cycle of a building (during the gateways process, building registration process, the safety case approach and throughout occupation) by recording the original design intent and ensuring subsequent changes to buildings are captured and preserved.

BS 8644-1 provides a more detailed framework and approach for addressing these areas.

INDUSTRY CHALLENGE

How we design, build and operate our buildings is changing at an exponential rate. The requirement to provide digital information is becoming more and more critical and will continue to grow as other activities such as electrical and HVAC systems are reviewed.

Changing to digital platforms for the construction and management of buildings will, for large parts of the industry, represent a transformative shift in current practices, but also a requirement that becomes more important.

Changes in these proposed reforms alone include but are not limited to:

- A new digital information exchange network for fire safety information "FIREie".

- Additional Fire Safety information at Information Exchange Points.
- Updates to existing documentation OIR, EIR, PIR and AIR.
- A digital competency matrix for fire safety.
- A requirement for the digital inclusion of the classification from the existing standard "EN 13501-1 Fire classification of construction products and building elements" i.e. A2-s1,d0.
- A digital standard of record-keeping for High-Risk Residential Buildings (HRRBs).

- A project-specific workflow to enable fire safety information to be coordinated within the digital asset.
- An inclusive design approach integrated within the golden thread.
- All fire safety information made available digitally.
- A fire safety parameter sheet.
- In existing buildings, a GAP analysis to identify fire safety information that may be incomplete, inaccurate or irrelevant.
- Evidence of the competency of individuals both in design and installation.

These changes do not only apply to new projects, but also to existing buildings, so we need a process to implement a procedure for new builds, as well as working out how we capture existing information.

We all have a day job to do so keeping across these changes, let alone understanding how to adopt and implement them, is challenging. Even for the digitally aware, the changes being proposed here represent a paradigm shift to what is already in place, which is why we at Symetri make it our business to keep across these changes, map them to processes and workflows and package them in best of breed, simple to understand and easy to use solutions.

SUPPORTING THE GOLDEN THREAD OF INFORMATION

At Symetri we have been looking at the processes and technologies that can support the Golden Thread of information throughout an asset's lifecycle and how this can provide a lifetime record of the building's construction. Two applications that we feel will bring real value to our customers in solving these challenges are:

1. Autodesk Construction Cloud (ACC)

The Autodesk Construction Cloud brings together the most powerful portfolio of construction managment software products in the industry, supporting workflows spanning all phases of construction—from design, to planning, to building, to operations.

2. Oculo

Oculo is a digital construction solution which combines hard-hat cameras, BIM models/floorplans & artificial intelligence to remotely view, share & track on-site progress.

Autodesk Build, part of the Autodesk Construction Cloud introduces the asset's module, where you can assign each wall penetration, cladding panel, fire door etc an asset tag, to capture the required digital information about that element. You can then link data, photos, checklists, certificates and identify the location of these on floor plans where non-compliance issues could be raised, monitored, and closed out. This will all be stored and linked in the Autodesk Construction Cloud with managed access for the lifecycle of the building. Oculo will bring another dimension to the technical offering of capturing evidence through the ease of 360 photographic capture.

By attaching the 360 camera to a safety helmet and simply walking the site, all rooms, penetrations, cladding and floors will be captured during the construction process, storing records of the materials utilised and the dates of install. This will not only assist the contractor with tracking progress, but will also present a lifetime record for the owner so any part of the building can be selected and reviewed and the evidence presented.

The camera can also be connected to your phone so detailed photographic images can be retained of the fire stopping and stored in the system.

SUMMARY & CONCLUSION

Digital Construction has become a key focus of the UK Construction strategy and we are all now getting accustomed to a lesser or greater degree, of delivering against the BS EN ISO 19650 suite of documents. The Building Safety Act, the BS8644-1 and the Fire Safety Act now takes the requirements specified in the Hackitt report to the next level of standards; defining requirements during design, construction, handover, asset management and for an emergency response. This starts to clearly identify responsibility and deliverables at each stage of project delivery along with what evidence needs to be captured for lifetime records. This can be outlined alongside the COBie deliverables, but with the additional requirements of a Fire Safety Parameter Sheet.

The Fire Safety Act was fast tracked in response to a particular set of tragic circumstances; however, this has also served to act as a catalyst to review other areas of construction and whilst fire safety is the first subject to be addressed, we expect other topics such as HVAC and Electrical systems to follow.

For more information on the digital requirements of Fire Safety compliance, please get in touch with us.

REFERENCES

References Grenfell Inquiry Phase 1 Report https://www.grenfelltowerinquiry.org.uk/phase-1-report

Hackitt Report https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/707785/Building_a_Safer_Future_-_web.pdf

The "BS 8644-1 Digital management of fire safety information. Part 1: Design, construction, handover, asset management and emergency response - Code of practice" https:// standardsdevelopment.bsigroup.com/projects/2019-02962#/section

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The Building Safety Act https://www.gov.uk/guidance/thebuilding-safety-act