SUMMARY

Sprinkler systems for culturally valuable buildings: Many valuable operating experiences

Since the beginning of the 2000s, automatic fire sprinkler and water mist systems have been installed in a number of Swedish churches and other buildings of cultural and historical value. However, there has been a lack of knowledge on how well these systems work in a slightly longer time perspective.

Purpose and goal

In the project, operating experiences from a larger number of facilities were documented. Issues that were interesting to document included good technical solutions, technical problems and bad solutions, incidents with water damage, operating and maintenance costs and possible fire incidents.

Methods

Information was collected through contact with individual dioceses, congregations and property managers, via compilation of information (inspection protocols and reports) and via a literature search on the internet. Site visits were also carried out at several selected objects during the autumn of 2023.

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Results

In summary, it is concluded that several facilities use technology that was completely unproven when the systems were installed and that this has resulted in many problems. Antifreeze has contributed to leakage through both automatic nozzles and pipe couplings. Additionally, antifreeze has caused high system pressures on hot summer days when the antifreeze in the pipes expands. For several of the facilities, water damage has occurred when automatic nozzles (or their glass bulb) burst. Freezing of remaining water in dry-pipe systems has also caused several malfunctions and in some cases extensive water damage.

For traditional sprinkler systems, galvanized pipes are often used in dry-pipe systems Several cases of internal pipe corrosion and leakage from pipes were documented. Inadequate slope of pipes towards low points and incomplete drainage of residual water is a contributing cause of the corrosion. For both traditional sprinkler systems and water mist systems, cases were also documented with long delay times before water flowed through the test valve.

Several suffocation incidents have occurred when nitrogen gas from a type of gas-powered water pump unintentionally flowed into technical spaces. Two of the incidents can be described as very serious.

A consistent observation is that the facility managers have a very important role for ongoing supervision and maintenance. But it requires a great deal of work and technical competence. For some facilities, high staff turnover has contributed to a lack of competence and supervision and maintenance have been neglected. Overall, the occurrence of technical problems and high total costs of operation, maintenance, service contracts and audit inspections have contributed to several sprinkler systems being shut down or even dismantled.