

COST ACTION C17

“BUILT HERITAGE: FIRE LOSS TO HISTORIC BUILDINGS”

1.1. Title

“Approaches and Methods of Fire Risk Quantitative Evaluation for Heritage Buildings in Bulgaria”

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Until 1990, there used to be a state insurance monopoly in Bulgaria. Moreover, most historical buildings were owned by the state, while the owners of the other non-state buildings were greatly restricted in their freedom to use and manage the buildings. As a result, insurance was entirely run by the state. Insured were the most valuable sites, including all heritage monuments of world and national importance. The changes, which have taken place since 1990, have led to the elimination of the state monopoly. At present the insurance business is entirely private.

The effective legislation does not provide for any special arrangements or special insurance types for historical buildings. The survey conducted has shown that most insurance companies have no experience in this field and practically show no interest in the insurance of historical buildings. Most companies include heritage building insurance in Damage and Property Insurance. Specialized fire insurance is offered only by *DZI AD* – the former national insurance company, which has already been privatized.

The quantitative fire risk evaluation used in Bulgarian insurance practice, which is also applied to fires in historical buildings, has applied three approaches – probabilistic, deterministic and mixed.

The probabilistic approach is based on the safety analysis, where most important is the “tree of events” method. The criterion of human individual risk is the probability of one person’s death at one site 1×10^{-6} per year. The site safety shall be considered sufficient if the factual values of the determined probabilities are lower. This method is believed to be relatively the most accurate one but its application requires time-consuming analyses made by highly qualified specialists and, therefore, it is too expensive to be commonly used.

The deterministic approach is less accurate but it is easier and cheaper to apply. Bulgarian insurers use mainly point methods to evaluate fire risk. Some insurers call them “small fire” risk evaluation method. The fire risk point evaluation methods are based on the comparison between the sum of the weighted evaluations of site risk specific indicators and the pre-approved risk evaluation scale. Foreign methods have been used, such as “Solution Pyramid” (USA), “E.R.I.C.” (France), “Virgilio” of Independent Technical Service (IES)” (England), etc.

In their fire risk evaluations, Bulgarian insurers use about 20 indicators, such as personnel, visitors, smoke protection, sewage, shafts, passages, internal coatings, furniture, staircase, corridors, fire alarm and fire extinguishing installations, fire hydrants, location of city fire service, etc. The final risk evaluation is the sum of the products of the weighted indicator values, included in the evaluation, and the coefficients of their availability at the site, which depend on the intervals of a specific scale.

Before using the point methods for the building fire risk evaluation, information must be gathered about the insured sites. The data are systematized in forms presenting data collected as a result of:

- Interviews with building owners, users and managers;
- Construction plan analysis
- Independent experts’ evaluation;
- Personal inspections conducted by insurer’s specialists.

In practice, the evaluations can be used not only for fire risks but also for other types of risks covered by the insurers. The evaluations shall be the primary criterion for calculating the amounts of insurance premiums.

The forms used to systematize the information collected for fire risk evaluation are prepared individually by the different insurers. They include several sections, which can generally be characterized as follows:

The first section includes general data, such as:

- Full name and address of the site;
- Dates of construction, launching, reconstruction and modernization activities;
- Investor, designer, builder, building supervision and statutory acts applied when designing the site;
- Location of the site and related external risk factors, as a result of weather conditions, neighbouring sites, level of seismological activity, information about past ignition-related fires or incidents, access to the site.

The second section includes data related to the prerequisites and conditions, related to the occurrence of fires, such as:

- Premises classified in groups depending on the electrical facilities contained therein;
- Fire resistance of the building structure and facilities;
- Combustibility group of construction materials and structures;
- Locations and methods of storing easily combustible substances and materials;
- Inside and outside fire-extinguishing water supply;
- Fire alarm, gas analyzing, fire extinguishing, security and other systems installed in the building.

The third section contains data about:

- The number of personnel and how well prepared they are to act in case of a fire;
- The admission rules operating in the building;
- The organization of running repair activities;
- Emergency plans and instructions;
- Description of the fire measures undertaken at the site – smoking restriction rules and how effectively they are implemented, use of electrical heaters; results of inspections conducted by the state fire control authority, recommendations and their implementation.

There is an independent section including data about the value of the insured site, and the valuable objects kept therein. The expression of the value involves not only the insurer's value but also the value given by the client requesting the insurance. The practice of Bulgarian insurers is first to take into consideration the

quantitative parameters specified by the clients and, in the event of a considerable difference between the client's assessment value and the insurer's assessment value, the insurer shall increase the insurance premium.