Mr. Gwenole Cozigou
European Commission
DG GROW Dir. C
Avenue d'Auderghem 45
1040 Brussel

Brussels, October 19, 2017

Object of letter: Putting Fire Safety Engineering on the right tracks

Fire Safe Europe (FSEU) is a broad and unique cross-sectorial alliance of fire experts, fire fighters, European associations, and international companies, including construction manufacturers and material suppliers of insulation, cable, concrete, ceiling, and fire protection equipment. FSEU's mission is to improve fire safety in buildings for European citizens.

Dear Mr. Cozigou,

Fire Safety Engineering (FSE) was discussed during the 1st Fire Information Exchange Platform meeting on October 16, 2017, and identified as one of the work streams for the platform. The purpose of this letter is to express our position on the opportunities and risks presented by FSE.

1. The need to build on good trends

The 20th century has seen continuous improvement in fire safety of buildings. Especially in its 2nd half, the available statistics on fire casualties and damages point to the successful implementation of fire prevention and fire safety strategies, mostly consisting of conventional prescriptive approach. This approach is based on passive fire protection measures using methods of non-combustibility, fire compartmentation, and structural fire protection. Wherever applicable and practical, this basic approach has been enhanced by active fire protection to complement and further enhance the achieved safety levels. Important aspects of this mix, which can be considered optimal based on the very high safety levels achieved, are:

- Validation of the approach by real fire cases;
- Feedback from long years of experience;
- Redundancies present in the combination of requirements in regulations and in test protocols.

Especially for traditional buildings, prescriptive approach remains the proven method accepted by all parties in the society: citizens, regulators, and industry. We foresee the further development of this area in updating safety criteria based on current products used in construction (e.g. smoke emissions from combustible building parts, adequacy of test methods).

2. FSE approach for non-typical buildings

Performance-based design of buildings using FSE tools opened the doors to designing large and complex buildings, where simple prescriptive rules would not suffice. This is definitely a move in the positive direction for these buildings. At the same time, the basic scenarios for fire development started to be questioned, often leading to less onerous fire scenarios, which further result in cost savings during construction; whilst this can be a great success when done correctly, it can also lead to risks of abuse as some will seek to lower the costs of fire scenarios regardless of whether or not it ensures a good level of fire safety. Despite risks of abuse, FSE in fact provides methods to truly analyse real fire scenarios which may be less but also more onerous than the standard fire curves.

However major pitfalls related to FSE have been highlighted [1]:

- The level of safety is not quantified (e.g. risk computations are not made)
- Quantitative performance evaluation formulas are not offered to determine if any particular fire safety subsystem is adequate
- Redundancy is considered as something to expunge, not as a valuable aid to safety - an assumption is built in that fire dynamics are fully known
- Designs start with, and are largely based on, fire scenarios which the designer is free to define or select
- The role of tests in determining the fire performance of products is reduced or absent

3. Role of redundancy / robustness / resilience

Whenever FSE tools and methods are used to meet and/or prove the performance criteria of building design, it would be desirable to know sensitivities of the calculation, input values, boundary conditions, and the final result. However, this is seldom the case. On the extreme end, one might suspect that optimisation for cost-reduction can become a goal of FSE design rather than achieving a high level of safety based on evaluating all the possible failures and designing appropriate safety measures. Unfortunately, it will take some time until fire statistics prove whether the good trends in fire safety start to reverse or not, i.e. whether our buildings do not tend to be less robust in case of fire accident and more prone to failures.

4. Regulators remain responsible for safety, not technicians

Precautionary principle has to be applied whenever a change is made to safety levels, criteria, test protocols, or methods to prove compliance. Overly optimistic assumptions on the move towards performance-based codes may result in disasters. Whenever a new method is allowed for use, it must be properly examined as to its suitability to provide equal or higher level of safety than the previous one. We begin to see examples of countries where the introduction of performance-based building design and implementing is questioned: Sweden, New Zealand [2], [3], [4], [5], [6]. In Europe, the current framework of the CPR has been created to facilitate free movement of building products and services, while defining the European fire safe buildings and competencies of individual private and public bodies. We sincerely hope that the progress towards better regulations and safer built environment will remain under the spotlight of the responsible regulators at all levels as well as the public, and responsibilities for the design of buildings, products and services will be ever clearer and more transparent. It is crucial that regulators ensure FSE is correctly used and does not lead to increased risks for fire safety.

Sincerely Yours,

Juliette Albiac
Managing Director
Fire Safe Europe (FSEU)
Mobile: +32 (0)476 641924
Email: juliette.albiac@firesafeeurope.eu
Join the discussion on fire safety in buildings in the EU!

Sources:

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[2] Safety in Case of Fire - The Effect of Changing Regulations, Lundin Johan, thesis, Lund University, 2005

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[5] Fifteen Years of Performance-Based Design in New Zealand, A.H. Buchanan, B.L. Deam, M. Fragiacomo, Tony Gibson, Hugh Morris (http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.598.657&rep=rep1&type=pdf)

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