PREFACE

Current practice in the European Union is safety, including Fire safety, nationally managed, and the demands are determined by the specific experiences of each country. While the political motivations for this approach are obvious, and local circumstances vary between countries, it can easily lead to similar processes having to be re-researched and re-invented country by country. In the context of the European Union safety requirements in case of fire are based on the Construction Products Directive 89/106/EEC. The Directive is applied to construction products as the essential requirement in respect of construction works. In Annex I of the Directive, the essential requirements for mechanical resistance and stability, and for fire safety, are summarised. The construction works must be designed and built in such a way that, in the event of an outbreak of fire: The load-bearing capacity of the construction can be assumed for a specific period of time; The generation and spread of fire and smoke within the works are limited; The spread of the fire to neighbouring construction works is limited; Occupants can leave the works or be rescued by other means; The safety of rescue teams is taken into consideration. The load-bearing capacity of the construction may be modelled on the principles summarised in the parts of the structural Eurocodes which deal with fire. The introduction of common standards in areas related to fire safety, it seems obvious that in such an important area the sharing of experience and research should be facilitated, and hence the need for networks in the COST model. For member states of the European Union,

However, the need for integration has a further dimension. Fire engineering researchers tend to specialise in areas such as fire dynamics, structural fire engineering, active/passive fire protection, environmental protection or human response. Since the background sciences of these disciplines are different there is little interaction between them. Practitioners, including fire engineers, building/fire control authorities, and fire-fighters tend to consider fire safety as a whole, but lack in-depth awareness of recent advances in research and are outside the academic research networks. Through encouraging the exchange of information on different aspects of fire engineering and response between researchers in different countries, the network intends to create an awareness of the current state of the art, and to avoid repetition of research. The non-research community will benefit from exposure to advanced research findings, discussion with researchers, and the sharing of best practice. Their input will make researchers aware of real-world constraints, and where new research and standards are needed.

The Action divides its membership loosely into three themed Working Groups, although clearly its overall mission of promoting integration means that these groups must interact on many of the key activities. The Working Groups are: WG1 Fire Behaviour and Life Safety focuses on the behaviour and effects of fire in buildings, combining this research-based knowledge with the most effective means of

protecting human life against the occurrence of fire in the built environment. This includes active measures in fire-fighting with the effects of building form on the inherent risk to inhabitants. WG2 Structural safety covers the response of different building types to fires and the rapidly developing research field of structural fire engineering, including new materials and technologies and passive protection measures. Crucial problems of structural fire engineering concern change of use of buildings and the current imperatives of sustainability, energy saving and protection of the environment after fire. WG3 Integrated Design brings together design, practice and research across the disciplines of fire in the built environment. In structural design this includes integration of fire resistance with all the other functional requirements of a building, from concept onwards, rather than simply adding fire protection after all other processes are complete. Active input from practitioners, regulators and fire-fighters through this group is vital to the success of the Action.

The Action started in March 2010, and now has 22 nations of the EU and New Zealand participants. Its first deliverable, State of the Art Report attempts to bring together the current state of research, mainly in the participating countries but set into the context of knowledge world-wide. The second deliverable allowed all experts in Action to inform about its research findings in Proceedings and during the Action Prague Conference 29 April 2011 was focused outside the Action as well. This third deliverable Case Studies presenting current practice and accumulated knowledge in fire engineering. The authors, experts of the Action, are trying to include on the selected fire engineering applications clear explanations of the decision processes, the scientific assumptions and the practical constraints, as well as how different aspects of fire engineering are integrated.

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References

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