

W014 - Fire

Interesting news on the future thrust of W014 came out of its recent meeting in Lisbon. More on the approach below and an introduction to the seven projects which the Commission has identified as meriting priority in the up-coming period.



Focused Activities From Now On

The Commission now plans to focus its activities says Coordinator Matti Kokkala as he looks back at the recent annual meeting of W014 which took place on 9th and 10th September 1999 at the Instituto Superior Técnico in Lisbon, Portugal.

In total, 30 members originating from 20 different countries attended where they had the opportunity to enjoy the wonderful hospitality of the hosting members Prof. Cabrita Neves and Prof. Valente. The pleasant climate and the beautiful city provided the ideal backcloth for a productive meeting.

The agenda included a review of the existing Work Programme which was established almost five years ago; a discussion on the prenormative research for the needs of ISO/TC92: Fire Safety (lead by Prof. Geoff Cox, Chairman of TC92) and a number of technical presentations on subjects of major interest to the members present.

In spite of the large membership of 75 professionals from 30 different countries, W014 has encountered problems in achieving the goals of the earlier very ambitious Work Programme. To render the work of the Commission more effective, the earlier subgroups were abolished and, instead, a number of more narrowly focused projects whose deadlines extended into the not too distant future were initiated. The new Work Programme (see below) comprises seven projects nominated within the CIB Priority Theme 2: "Performance-Based Building Codes and Standards".

New Secretary

Dr George Hadjisophocleous of NRC, Canada was nominated as Secretary of the Working Commission. Notes Matti Kokkala: As Coordinator I am very grateful to George for volunteering to help me in keeping the membership better informed between the meetings.

W014 also decided to endorse the FORUM initiative to update the ten year old compilation of computer codes used in fire safety engineering. The information will be gathered through internet by NIST under the Coordination of Richard W. Bukowski who also serves as the current secretary of FORUM (see <http://www.bfrl.nist.gov/info/forum/forum.html>).

Working Commission Meetings

W014 will meet annually. The next two meetings have been agreed to take place on 14th June 2000 in Lund, Sweden and on 29th March 2001 in Wellington, New Zealand.

Workshops

In addition W014 will organise Workshops on special topics within its Work Programme. No fixed plans exist but the following possibilities are under active discussion:

- Workshop on Structures in Fire (possibly in June 2000)
- Workshop on Fire Safety of Historic Buildings (possibly in 2000)
- Workshop on Fire Safety Engineering (on 28th March 2000 in Wellington, New Zealand)

Conferences

W014 has been intensively involved in the very successful CIB co-sponsored series of Conferences on Performance-Based Codes and Fire Safety Engineering. The 3rd International Conference on Performance-Based Codes and Fire Safety Design will take place from 15th to 17th June 2000 in Lund, Sweden. This event will be organised by the Department of Fire Safety Engineering at Lund University and the Society of Fire Protection Engineers (USA). The Coordinator of W014 plays a major role in the Programme Committee of these Conferences.

W014 also plans to be an active contributor to the upcoming CIB World Congress in Wellington, New Zealand in April 2001.

W014 has also been asked to take a prominent role in the Conference Technical Basis of Performance-Based Fire Regulations to be held under the auspices of the United Engineering Foundation. The Coordinator has agreed to be a member of the planning team together with two other members of W014.

DRAFT

Work Programme of CIB W014: Fire 1999 - 2001

(In accordance with established procedure this will be submitted for approval to the CIB Programme Committee)

This draft programme has been compiled by the Coordinator in the light of discussions and decisions made during the Annual Meeting on 9th - 10th September 1999 in Lisbon.

Objectives and Scope

The purpose of W014 - Fire is:

- to provide an ongoing research focus for the development of a sound technical basis for fire safety engineering (FSE) methods
- to promote the acceptance of fire safety engineering methods and their relationship with performance based codes
- to provide fire safety technology input to other CIB Working Commissions as appropriate, and
- to transfer fire safety engineering outputs internationally, including the standards community

To Meet the Objectives

- projects with well-defined scopes and limited time schedules will be launched to carry out the work
- the output of the Commission will be published in the form of CIB Publications and/or in international journals and workshop or conference proceedings, etc.
- workshops on the topics of the work programme will be organised
- conferences serving the purpose of the Working Commission will be co-sponsored by CIB
- the members of W014 will circulate information on ongoing and completed research projects and research publications to other members

Priority Projects

The Commission has identified seven projects as meriting highest priority during the working period prior to the next CIB World Congress from 2nd to 6th April 2001 in Wellington, New Zealand. All the seven projects fall within the CIB Priority Theme 2: "Performance-Based Building Codes and Standards".

- **Guidance document on rational fire safety engineering approach to fire resistance in buildings (contact: Kruppa, France)**

Fire resistance has traditionally been treated through fire resistance ratings based on the performance of separating and load-bearing structural components in standard fire resistance tests. Increased understanding of fire and the development of fire safety engineering as a special profession has opened up possibilities for a more flexible approach to fire resistance.

This project aims at producing a document providing guidance to engineers and regulators on a rational approach to fire resistance. The project is in fact a continuation of the work carried out by the former SG5 of W014 under the leadership of Joel Kruppa of CTICM, France.

The schedule is to finish the draft text by 31 December 1999 and, after a period for comment, to prepare a final draft for publication as a CIB Publication by 30 June 2000.

- **Building and occupant characterisation in FSE guides (contacts: Bukowski & Hall, USA)**

Modern fire safety design of buildings takes into account both the buildings (materials, layout) and the occupants therein. A critical step in the design is to develop characteristic data for the design, i.e. what and who will be in the building when fire begins.

This project will review building and occupant characteristics in Fire Safety Engineering Guides internationally. The project is a continuation of the work done with the former SG1 of W014 under the leadership of Richard W. Bukowski of NIST, USA.

The schedule is to submit the first draft for comments by 31 December 1999. This draft will contain information on a limited number of countries/organisations and the whole W014 membership is requested to fill in similar information from their national documents. The final draft is expected to be available for publication by 31 December 2000.

- **Compendium of statements of objectives and functional requirements (contact: Meacham, USA)**

The project is a contribution to one of the three projects prioritised by the CIB Board as part of the CIB Pro-Active Approach on Priority Theme 2: Performance-Based Codes and Standards. As progress is made, results will be submitted to relevant CIB Task Groups and Working Commissions.

Due to the large number of different fire safety related statements of objectives and functional requirements in international standards, design guides, and regulatory documents, it is expected that the compilation also needs to be published separately. This will make it of interest to an important target group of fire safety professionals who do not normally follow other parts of building codes and standards.

The schedule is to produce the first draft by 1 April 2000 to be discussed at the W014 annual meeting in June. The final draft is to be submitted for review to the members by 1 February 2001 and for discussion at the subsequent Working Commission meeting. The document will be submitted for publication by 30 September 2001.

- **Compilation of frequency, probability and reliability data to support risk-informed performance-based fire safety engineering (contacts: Bukowski & Meacham, USA)**

The project aims at publishing a compilation of frequency, probability and reliability data needed for

risk-informed performance-based fire safety engineering and regulation. The work continues the earlier work by Bukowski within the former SG1.

This project will require identification and collection of frequency, probability, and reliability data for use in risk, uncertainty and reliability analyses. It will include, but not be limited to, fire injury, death and property loss data by country; sources of data for fire safety analysis (modelling) and associated uncertainty; and reliability data for components, equipment, systems, buildings and people. The outcome of this effort will be a document, and perhaps databases, with data to support fire safety engineering risk, uncertainty and reliability analyses. It is planned to complete an initial set of documents and databases no later than December 2001.

The schedule is to provide a first draft by 1 April 2000 to be discussed at the W014 annual meeting in June. The final draft will be submitted for review to the members by 1 February 2001 and for discussion at the subsequent Working Commission meeting. The document will be submitted for publication by 30 September 2001.

- **Compendium of reference cases for validating the performance of zone and field models (contact: to be confirmed)**

The former Sub-Group 2 of W014 tackled the issue of model validation by running an extensive round robin on fire growth and smoke movement models. The blind simulations highlighted not only possible problems with the models but, especially, potentially serious problems as regards the capability of the users.

This project aims at improving the quality of the models and their application by compiling a set of reference cases, for use both by the model developers and the engineers using the models. The reference cases will vary in scale and complexity to challenge the models sufficiently for different purposes.

The schedule is to provide a first draft by 1 April 2000 to be discussed at the W014 annual meeting in June. The final draft is to be submitted for review to the members by 1 February 2001 and for discussion at the subsequent Working Commission meeting. The document will be submitted for publication by 30 September 2001.

- **Compendium of reference cases for evaluation of methods for calculating temperature in fire exposed structures (contact: Wickström, Sweden)**

Numerical methods are commonly used for assessing the temperature in fire exposed structures. Increasing the confidence in the use of calculation tools would require the computer codes to be both verified and validated. By verification we mean here the process of determining that a model implementation accurately represents the developer's conceptual description of the model and the solution of the model (i.e. that the equations are correctly solved). By validation we mean the process of determining the degree to which a model is an accurate representation of the real world from the perspective of the intended uses of the model (i.e. that appropriate equations and input data are used).

This project aims at providing a set of reference cases for verification of the model for situations that commonly occur in practice. The cases will vary in complexity in order to challenge the models for different applications. For some of the cases analytical solutions will be provided. For cases with no analytical solution, results from benchmark numerical calculations will be published.

The schedule is to provide a first draft by 1 April 2000 to be discussed at the W014 annual meeting in June. The final draft is to be submitted for review to the members by 1 February 2001 and for discussion at the subsequent Working Commission meeting. The document will be submitted for publication by 30 September 2001.

- **Guidance document on a rational fire safety engineering approach to fire safety in historic buildings (contact: Papaioannou, Greece)**

The renovation of buildings of significant historical or architectural value always needs special consideration. Fire safety provisions usually do not meet the present standards. Modern fire protection materials and products may be applied to improve the fire safety.

This project aims to produce a guidance document on the use of a fire safety engineering approach in the case of historic buildings. The target audience of the document will be both the practising engineers and those responsible for the historic buildings.

The schedule is to provide a draft by 1 April 2000 to be discussed at the W014 annual meeting in June. The final draft is to be submitted for review to the members by 1 February 2001 and for discussion at the subsequent Working Commission meeting. The document will be submitted for publication by 30 September 2001.

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All the above projects aim for a completed document by the end of September 2000 at the latest. The progress of the projects will be reviewed at the W014 meeting on 14 June 2000 in Lund, Sweden and again on 29 March 2001 in Wellington, New Zealand. A progress report on each of the projects will be submitted to the members prior to the annual meetings.

Each draft will be prepared by a small number of experts and then subjected for review by other members of W014. Draft documents will be put up on the W014 Home Page <http://www.vtt.fi/rte/firetech/cibW014>. The project team will decide whether comments should be sought from the W014 membership only or from a wider public.

Other Work Items

Matti Kokkala emphasises that members are welcome to contribute to other items of work that support the overall purpose and goals of the Working Commission. Documents prepared by the members will be submitted for review with sufficient regional and professional representation. This review may result in a) a submission of the document for public review by the whole W014 membership, b) a recommendation to establish a small project team to work on improving the document, or c) a recommendation to continue the work in a more appropriate forum. Part of the earlier activities, including the one on a guidance document concerning protection of disabled people against fire, will be dealt with in this way. W014 will also study the possibility of transferring Japanese research papers on exit design into international documents for submission as Work Item proposals to ISO/TC92.

(Our thanks to Matti Kokkala for this comprehensive report.)

