FQ0670/10

Report on ISO TC 92 SC4 Meeting, October 2010

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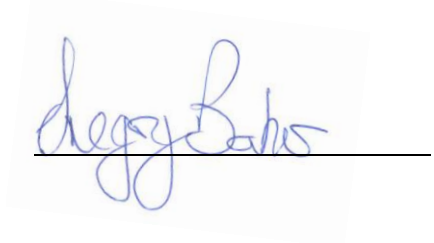

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Report on ISO TC 92 SC4 Meeting, October 2010

1. CLIENTS

- Foundation for Research Science and Technology
- BRANZ
- Department of Building and Housing
- Standards New Zealand

2. BACKGROUND

The purpose of this report is to provide information to BRANZ, Standards New Zealand (SNZ) and the Department of Building and Housing (DBH) about the activities of ISO TC92 SC4 (fire safety engineering) and to serve as a record of attendance at ISO TC 92 SC4 during the week of October 25 – 29, 2010 in Hangzhou, China.

Colleen Wade and Greg Baker attended the ISO TC92 Subcommittee 4 meetings during the week representing Standards New Zealand.

2.1 Background for attendance at meeting and representation on committee

The Foundation for Research Science and Technology, BRANZ and the Department of Building and Housing are funding research to develop a risk-based design fire tool in recognition of the need for the development and support of design methodologies that will lead to greater robustness and confidence in fire safety engineering design. The current review of the Building Code by DBH may also lead to significant changes to how fire safety engineering is conducted in New Zealand. The possible adoption of several ISO TC92 produced documents is also being considered as part of a fire safety engineering framework.

ISO TC92 SC4 is an International Standards Organisation sub-committee that is responsible for developing international standards and guidance documents related to fire safety engineering. New Zealand participation in ISO TC92 SC4 and its associated working groups provides an important opportunity to ensure the New Zealand research, and new Building Code changes benefit from international linkages by working closely with other international experts in this field as well as providing an opportunity to learn from and influence international directions in fire safety engineering.

2.2 Structure of ISO TC 92 SC4

This sub-committee consists of the main plenary group supported by a number of working groups and task groups. Most of the actual work done takes place in the working and task groups.

The meetings attended included the following:

- Task Group 1 (convenors meeting)
- Working Group WG1 (general principles and performance concepts);
- Working Group WG6 (design fires);
- Working Group WG7 (verification and validation of calculation methods);
- Working Group WG9 (calculation methods);
- Working Group WG10 (fire risk assessment);

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- Working Group WG11 (behaviour and movement of people);
- Working Group WG12 (fire performance of structures);
- Joint meeting with SC3 on life safety criteria based on toxic hazard
- SC4 plenary session

The various working groups are currently drafting a range of documents, some of which will ultimately become international standards. Depending on the final intended application of a document and its stage of development the following abbreviated notations are used in identifying relevant documents:

PWI	preliminary work item
NP	approved work item
WD	working draft
CD	committee draft
DIS	draft international standard
FDIS	final draft international standard
DTS	draft technical specification
TS	technical specification
TR	technical report
IS	international standard

A technical specification (ISO/TS) is reviewed/balloted after three years in order to decide if it will be confirmed for a further three years, revised to become an international standard or be withdrawn. Final outputs are either technical reports or international standards, with a strong preference for the latter wherever possible.

3. ACTIVITIES

3.1 Task Group TG1 (meeting of convenors)

Convenor: J Kruppa, France.

Meeting No. 23 (25 October 2010, 9.30 am)

This was a general meeting of working group convenors to liaise on the program for the week and brief each other on common issues and items to be discussed in the working groups during the week.

- Participants are reminded to check the ISO live-link website for the official SC4 membership list to ensure its accuracy and currency.
- There is a new p-member from Portugal.
- Prof Papaioannou, Greece questioned the Geneva criterion for p- and o-membership and thinks it needs review. His concerns regard only the need to vote, regardless of having input or knowledge of the documents concerned.

- Dieter Brein, Germany said there is a need to discuss the ISO 13387 series of Technical Reports and their eventual replacement by newer documents.
- Joel Kruppa, France presented an updated flow chart showing the relationships between the work and the documents of the various SC4 work groups.
- The Working Group convenors described their proposed work group activity to be discussed during the week.
- Joel Kruppa described a proposal to renumber SC4 documents so it is more obvious which are the related documents, both to make it clearer to the user, but also so that maintaining various documents becomes easier. This seemed a good idea but there is discussion and agreement from the Geneva secretariat required.
- Mr Dominique Parisse, France gave a presentation of rate of heat release and the contribution of the Paris fire department statistics showing an estimated of rate of heat release of 4.9 MW for residential fires based on 15 minutes use of a single LDE hose. It was suggested that this might be useful for WG6. Mr Parisse will provide a copy of slides to the secretary to distribute. Eric Guillaume also noted the SC3 WG6 work on correlating cooling power versus heating power based on research in Lund, Sweden.
- There was discussion on possible work in the area of wildland fires. Prof Papaioannou believed that mainly work in this area needed to be done in SC3.
- There was discussion on the comments made by SC4 on the ISO TC59 draft document ISO 21542 "Building construction – Accessibility and usability of the built environment" and actions regarding the comments received.
- Official invitations for the next meeting at AFNOR in Paris will be sent within the next few weeks.

TG1 also met on Thursday to discuss the proposed business plan for ISO Technical Committee 92.

3.2 Working Group WG1 (general principles and performance concepts)

Convenor: Prof. Takeyoshi Tanaka, Japan

Meeting No. 4 (26 October 2010, 2.00 pm)

Dr Tanaka proposes a work plan for example fire safety design requirements. He proposes to:

Step 1: Produce an informative document collecting and compiling the fire safety design objectives, functional requirements and safety criteria that have been developed by member countries or that are expected to be completed soon.

Step 2: Develop an agreed document of examples of fire safety objectives and functional requirements for non-industrial buildings.

Member countries were invited to offer contributions from their countries. Dr Tanaka, C Wade, and Dr J Hall all indicated possible material from their respective countries.

Regarding safety factors and reliability – Dr J Hall, USA had previously distributed a document (N139) to a WG10 task group, but is still waiting on a response from them. Dr Weise, Germany was not present at this meeting so detailed discussion on this topic was not held.

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3.3 Working Group WG6 (design fire scenarios and design fires)

Convenor: C. Wade, New Zealand

Meeting No. 22 (27 October 2010, 9.00am)

This working group has previously produced a Technical Report ISO/TR 13387-2 Fire Safety Engineering - Part 2: Design fire scenarios and design fires, as part of the suite of ISO/TR 13387 reports.

More recently this has been supported by Technical Specification ISO/TS 16733 “Fire safety engineering – selection of design fire scenarios and design fires” published on the 7 July 2006. Two examples of the selection of design fire scenarios are currently included in the technical specification: for a multipurpose covered stadium, and for a warehouse containing a single commodity.

The guidance provided in ISO/TS 16733 is of a general nature and takes users through the process (steps) of identifying design fire scenarios and their characteristics. It does not give any detailed specifications (i.e. numerical values) for design fires to be used for any particular occupancy. The technical specification is written with a deterministic assessment in mind and therefore is aimed at providing guidance on how to reduce a very large number of possible fire scenarios down to a manageably small set of design fire scenarios (scenario clusters) that can be used in an analysis.

Work item: PWI 29241 Examples

WG6 is in the process of developing two examples of the selection of design fires characteristics to accompany the design fire scenarios given in Annex B and Annex C of ISO TS 16733. The first example is for a multi-purpose covered stadium and the second for a warehouse with a single commodity. The intention is to follow the subsections of ISO TS 16733 Section 7 to illustrate its use.

At the current time only one of the examples is active, the covered stadium. Work on the warehouse example has been deferred because the project leader considered it was necessary to first address matters relating to use of a safety concept before the worked example could be advanced.

Since the previous meeting, C. Wade had revised the stadium example and distributed this to the task group and working group members. She discussed the changes that had been made including the addition of new material from Dr Hall providing fire incident statistical data to support the location of fire room selection and the weightings assigned. There was some discussion on the process of the selection of fire scenarios and in particular the use of probability as part of the scenario selection process. Dr Hall enquired whether scenarios should perhaps be ranked based only on consequence, with their probability introduced only as part of a risk assessment. This may address the problem with prematurely excluding system failure scenarios at this early time of identifying scenarios for analysis. The project leader, C Wade will consider the comments made at the meeting and revise the example and distribute this to a task group of Dr Hall, Dr Nazir, Dr Harada and Dr Brein.

Eventual balloting of this example will accompany the DIS balloting of TS 16733 as possibly DIS 16733 Part 2 and Part 1 respectively.

SC3/SC4 Work Items:

The suggested work item relating to a classification approach for assessing toxic hazard of finished products in buildings is not adequately developed for action at this

stage. C. Wade and Dr Gann will consult to further refine the scope of work and this will be discussed again at the next meeting. C. Wade thought it would be most useful for the practitioners if statistical distributions of fire parameters were available and this could be one direction considered for such a project.

Another suggested work item and statement of scope prepared by C. Wade and Dr Gann to extend the covered stadium example to include an evaluation of tenability of the fire effluent was discussed. Work might begin on the example following the completion of the WG6 and WG11 examples. WG6 requested SC4 to consider which work group should host this potential work item in the future.

Data Requirements for WG6:

A draft table containing a list of data requirements for WG6 was discussed. The table may form an annex to TS 16733. Further contributions were invited and the document will be re-circulated to WG6 prior to the next meeting.

3.4 Working Group WG7 (verification and validation of calculation methods)

Convenor: Mr Dieter Brein, Germany

Meeting No. 22 (26 October 2010, 9.00am)

Main Document: ISO 16730 Fire safety engineering -- Assessment, verification and validation of calculation methods (Published in July 2008).

ISO 16730:2008 provides a framework for assessment, verification and validation of all types of calculation methods used as tools for fire safety engineering. It does not address specific fire models, but is intended to be applicable to both analytical models and complex numerical models that are addressed as calculation methods in the context of this International Standard. It is not a step-by-step procedure, but does describe techniques for detecting errors and finding limitations in a calculation method.

ISO 16730:2008 includes the following:

- a process to ensure that the equations and calculation methods are implemented correctly (verification) and that the calculation method being considered is solving the appropriate problem (validation);
- requirements for documentation to demonstrate the adequacy of the scientific and technical basis of a calculation method;
- requirements for data against which a calculation method's predicted results shall be checked;
- guidance on use of ISO 16730:2008 by developers and/or users of calculation methods, and by those assessing the results obtained by using calculation methods.

Work item: ISO/NP TS 13447 Guidance for the use of fire zone models

This project with C Wade as task leader and principal author is underway in order to address particular characteristics of zone models with special emphasis on ranges of applicability, limitations etc. This is done in order to ultimately make it clear where zone models may be used and where it can be wise to apply more elaborated approaches, i.e. CFD models. A WD manuscript is available and will be further developed by a Task Group.

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Dr Brein described a concern in Germany that the impression of readers of the document are that there are many limitations. This may give the wrong impression, and the AHJ may say that zone models cannot be used for any application. C. Wade and Dr Brein agreed to edit the document before the end of 2010 with the assistance of W. Jones from NIST, USA. A checklist will also be developed as an annex to the document.

Work item: PWI 24677 Data for validation of calculation methods

Dr Brein outlined the background to the development of a document for data needed for validation of calculation methods. He noted the size of the task necessary to proceed with this work. He invited discussion from the attendees on the topic of how to proceed.

He suggested that one approach is to develop a structure on how to distribute work around the various work groups. There is a need to avoid duplication and to develop a common understanding of how to approach this work.

Mr J Kruppa reminded the meeting that it should be directed at data for validating and verifying a calculation method and this is different to the data needed by other work groups that require data for input to calculation methods. Dr Brein did not favour collating actual specific data, but rather to only describe the characteristics of the data required.

Mr J Kruppa said we may need to have multiple tests to validate methods, not just one test. Different sizes and types of test may be needed to achieve the range of applicability required. Mr J Kruppa said it will be useful to have a package of data that would be available to users to compare the models against.

Dr Brein does not believe that it should be the work of WG7 to determine if a set of data is appropriate to use for validation of a specific model.

Mr Lu, China said we need a list of the kind of data that WG7 requires. His laboratory has a large amount of data that might be useful.

C. Wade suggested looking to the work of the Nuclear Regulatory Commission in their study of the validation of models and see what criteria were used to select an appropriate dataset(s). What are the desirable characteristics of a dataset to be used for validation purposes? e.g. known measurement uncertainties by a quality assured laboratory conducting the experiments.

Prof. K Papaioannou queried the practicality and meaning of ‘third party’ audits.

Dr K Harada said the model developer is always thinking about validation of methods e.g. the ceiling jet correlation for unconfined ceiling has been validated many times, but when the same correlation is applied to a confined complex ceiling geometry it may not be applicable. Part of the tasks can be done by WG9 when concerned with the verification process where the range of application should be clearly stated, and limitations included.

Dr Brein proposes to write some generic text based on the N90 document, and apply this to the 4 examples to see if these requirements are also applicable to prove the validity of these calculation methods. This would have the advantage that we have project leaders that are familiar with the data and calculation methods. If the comparison shows that there is nothing better, then we will have to accept that for the time being and then aim to further improve on that in the future. Dr Brein proposes that he take on board the discussion and together with information from ISIS and FDS and zone modelling, we can collect data and references and carry on the work and this

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would be an item for discussion at the next meeting. WG9 also agrees to look at consequences if we change factors in the input fields that may change the application of the methods in the WG9 document.

Dr Nazir suggested a presentation at the next meeting in Paris and agrees to prepare a proposal on this matter.

Dr Brein also noted a presentation at Eurofire 2009 by Simo Hostika that outlines examples on the validation of FDS. Document N172 was distributed on the memory stick describing this. Dr Brein will also look at making large documents available via FTP, Benoit agreed to load some of the documents onto live-link.

Work item: ISO/NP TR 10796- 1 through 4:
4 examples on calculation methods are developed to demonstrate the applicability of procedures described in ISO 16730 on distinct calculation methods for several types of physics based mathematical models (zone model "CFAST", CFD model "ISIS", structural model "WALL2D" on predicting the fire performance of wood-framed wall assemblies) as well as for equation-based calculation methods (egress model "EXIT89").

Dr Brein reports that Walter Jones agreed to update the CFAST document by December 2010. Dr Brein then briefly described the content of document N139 on the French ISIS model and he proposes that this example now be put forward for balloting.

Document N135rev needs a forward to be added, but in principle has the required format. Dr N Benichou is requested to provide a word-format document to the secretary.

The documents for the Exit89 example have been compiled into the document N171.

ICFMP International Collaborative Fire Modelling Project

Dr Brein described the report from Dr Dey. He suggested adding to ISO 16730 some material related to carrying out blind exercises. There is a need to set up rules for how to do blind exercises. Different users may choose different inputs to a specific model and therefore introduce corresponding scatter in the results obtained using the model.

Dr Brein will take some key information from Dr Dey's report and will distribute this to the working group. Dr Dey will be at the next meeting and will make a short presentation on suggested improvements to ISO 16730.

3.5 Working Group WG9 (calculation methods)

Convenor: Prof. K Harada, Japan.

Meeting No. 22 (28 October 2010, 2.00pm)

WG9 are preparing documents describing the use of specific calculation methods relating to various fire phenomena. Describing the limitations of calculations as well as the actual equations is seen to be important.

There are three relevant work items for WG9:

1. PWI 16737: a revision to ISO 16737 Fire safety engineering -- Requirements governing algebraic equations -- Vent flows
2. PWI 24678: for algebraic equations on flashover-related phenomena.

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3. PWI 29763: for thermal radiation from pool fire flames.

Work item: PWI 16737

PWI 16737, revision of the International Standard ISO 16737:2006 "Fire safety engineering - Requirements governing algebraic equations - Vent flows". This document is currently out for balloting. Dr Harada described the changes that had been made.

Work item: Revised PWI 24678

Following discussion at the previous meeting, a revised document on requirements governing algebraic equations on flashover related phenomena was provided by Mr N Alvares (not present). At this time it is intended that this document be a technical report and not a standard.

Dr Harada will discuss further changes with the project leader Mr N. Alvares.

Work item: PWI 29763

Mr A. Alvarez provided a revised draft for PWI 29763: Requirements governing thermal radiation from pool fire flames.

It was agreed that Annex C was outside the scope of this PWI and should be a new document and be subject to discussion on a new work item. Working Group members agreed that further development of the document should be continued by project leader A. Alvarez with help from Dr Harada.

SC3/SC4 Joint Project List

A new work item will be commenced on flame spread algorithms with a task group comprising Dr Harada, C. Wade, Dr Ni and Dr Kim.

There was some discussion of possible work relating to wildland fires, and what countries were currently carrying out work in this area. It was considered that due to limited resources and expertise WG9 was unable to become active in this area in the near future. Mr Greg Baker suggested that because this topic was a very specialised area, it required a separate subcommittee to be formed.

3.6 Working Group WG10 (fire risk assessment)

Convenor: Dr. John Hall, NFPA, USA.

Meeting No. 22 (29 October 2010, 9.00am)

This working group has previously prepared ISO/TS 16732 guidance on risk assessment for use in fire safety engineering. This document has been published.

TS 16732 provides the conceptual basis for fire risk assessment by stating the principles underlying the quantification and interpretation of fire-related risk. These fire risk principles apply to all fire-related phenomena and all end-use configurations, which means these principles can be applied to all types of fire scenarios.

TS 16732 has recently received DIS balloting including an example annex consisting of NWI 29243, Part II. The results of the balloting were 17 in favour and 1 against (UK).

The comments from France indicated that they wished for duplication in the area of developing the fire scenarios to be avoided since that area is covered separately in the ISO TS 16733 document. It was thought the hazard identification and scenario development in steps 1 to 5 of TS 16733 may be common and only later is the number

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and selection of scenarios for analysis different depending on whether a deterministic or probabilistic approach is to be followed. Dr Hall thought that some changes could be made that would include greater reference to the TS 16733 document that may at least partly satisfy the intent of the French comments.

The comments from United Kingdom were wide-ranging and somewhat critical but very non specific and therefore it was difficult to propose any actions to be taken as a result.

Work item: PWI 29242

This covers the two common examples with WG6. These examples are being developed within WG6 and it is expected that they will be able to be used as a basis for WG10 examples at a later time.

Work item: PWI 29243

This includes N. Benichou's example using Firecam for a multistorey office building which is the most advanced example and in relatively good shape. There was no further discussion on this example.

Work item: PWI 12607

Dr Taveau talked about the example for a propane storage facility with an objective to reduce the probability of a BLEVE to an acceptable level. He addressed questions raised at the Christchurch meeting. Dr Taveau will continue to improve the example for further discussion at the next meeting.

Other Business:

Dr Hall described a draft of a document on a simplified approach to scenario specification and fire frequency estimation for use with ISO 16732 as a potential annex to DIS 16732 (or TS 16733). It is intended to assist countries with a limited amount of fire incident data who wish to utilise a larger dataset such as fire data from the USA. Dr Hall will further develop the document for discussion at the next meeting, and invites comment from the members of WG10 as well as WG6 members.

3.7 Working Group WG11 (Behaviour and movement of people)

The convenor is Rita Fahy, USA

Meeting No. 22 (27 October 2010, 2.00pm)

Work item: ISO/CD TR 16738

WG11 is a work group concerned with behaviour and movement of people.

ISO/TR 16738 (ISO/TC 92/SC4 N515) Fire Safety Engineering – Evaluation of behaviour and movement of people was published in July 2009.

Work item: PWI 29761 Occupant behavioural scenarios

A new draft of Preliminary Work Item 29761 (WG11 N75) on 'Design Occupant Behavioural Scenarios and Design Behaviours' (project leader Dr. Fahy), was discussed at the meeting. An amended text will be circulated for consideration at the next WG11 meeting. It was decided to maintain the status as PWI for the present, until a more definitive text has been agreed.

A task group of Erica Kuligowski, Daniel Nilsson, Steve Gywnne and Amanda Robbins prepared a document on developing fire safety scenarios, trying to better show the process and interactions between the fire, behavioural and structural inputs to the

scenario formulation and selection. There was no further development of the example to be reported at the meeting by the task group.

Amanda Robbins, New Zealand is also developing a second example for an aged population but there was no presentation at this meeting.

Joel Kruppa said that the safety margin for a design should not be expressed as time, rather as a margin in the relevant parameter, temperature, dosage etc. ASET versus RSET with a time margin is too simple a concept. Since each individual has an associated RSET, how can you calculate an ASET for a person because once they leave the building – they no longer are exposed. It is necessary to track the FED dose (for example) of each individual as they leave the building. What does the statistical distribution of FED doses for all occupants then look like?

3.8 Working Group WG12 (fire performance of structures)

Convenor: Dr Noureddine Benichou, NRC, Canada (--- via SKYPE)

Acting Convenor for the Meeting: Mr Joel Kruppa, France

Meeting No. 14 (28 October 2010, 9.00am)

Work item: ISO/WD 24679 Fire safety engineering – Performance of structures in fire

This working group is currently engaged in the preparation of a technical specification for guidance on structures in fire for use by fire and structural engineers. The document 24679 is now ready for publication as a Technical Specification and is in the process of being published.

Dr Kirby (not present) provided a document of data requirements. Dr Kirby will be invited to make a presentation at the next meeting describing this document.

Dr Harada presented a Japanese example application being a case study of a steel office building. Their example will be revised and improved and discussed again at the next meeting.

Qiu Peifang of Tianjin Fire Research Institute, China presented a case study from China for an airport terminal. This is a 3 storey steel structure of 71,000 m2 area and 22 m high. Work on the example will continue and be completed for further discussion for the next meeting.

Greg Baker described progress on an example being prepared in New Zealand by BRANZ. It is for the same building described in the Japanese example. This example will be presented more fully at the next meeting.

3.9 Joint Meeting SC3/WG5 and SC4

Convenor: Dr D Gann, NIST

Meeting No. 6 (25 October 2010, 2.00pm)

D. Gann summarised and updated the status of the list of potential new work items previously prepared for discussion and consideration by the various work groups in SC3 and SC4. The list is included as Appendix A of this report.

3.10 SC4 plenary session

Chairman: Dr Joël Kruppa

Secretariat : AFNOR – Mr Benoît Smerecki

The working group convenor reports were presented at the plenary session.

A copy of the resolutions made by SC4 are given in Appendix B.

Location and date of next meeting: Paris, France, April 3 – 8, 2011.

4. SUMMARY

This report summarises activity in ISO TC 92 SC4 on fire safety engineering as discussed at the October 2010 meeting in Hangzhou, China.

APPENDIX A
ISO/TC 92/SC 4 N535

Candidate Work Items from
Matrix for Use of Tenability and Smoke Toxic Potency Information
in Fire Safety Engineering
RGG; 3/12/2010

SC3

1. Standard on requirements for large-scale test methods to represent toxic gas and smoke hazards in different fire scenarios. Document on scenarios for large-scale fire tests **(SC3 WG1)**

   This International Standard will provide guidance for the set-up of large-scale fire tests which represent different well-defined fire scenarios, and presents guidance on the measurement of toxic gas and smoke hazards. It provides bases for comparing the results among different types and scales of such tests.

   Status: Rough draft to be developed by SC3 and circulated to SC3 and SC4 (copies to SC1) for discussion, probably in Paris (04/2011); **Action: Dave Purser**

2. Normative documents on obtaining fire effluent data for finished products **(SC3 WG1)**

   a. Standard for correlation of toxicity data among physical fire models and full-scale tests **(PWI 29903)**

      This International Standard will provide principles for characterizing the yields of toxic gases from a laboratory fire test and provides bases for comparing the results among different types and scales of such tests. This Standard also includes consideration of the uncertainties in the gas yield determinations. The combined uncertainty is a key factor in the ability to establish similarity or difference of test results. The sufficiency of the agreement between a bench-scale test and a real-scale test depends on the needed precision in the fire hazard or risk assessment. This is not covered in this Standard.

      Status: NWI approved; progression to a CD to be discussed in Christchurch. **Action: Per Blomqvist**

   b. Bench-scale method for the determination of hazardous components of fire effluents **(ISO/TS 19700; controlled atmosphere cone calorimeter)**

      ISO/TS 19700 describes a tube-furnace method for the generation of fire effluent for the identification and measurement of its constituent combustion products, in particular, the yields of toxic products under a range of fire decomposition conditions. The use of this apparatus is generally applicable to individual materials, to products that are layered such that the layering will not result in a significant change in product yields with time in real fires, i.e. to products where the upper surface does not provide major protection to the sub-layers. This method has been designed to provide data for input to hazard assessments and fire-safety engineering design calculations.

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Interest has been expressed in SC1 WG5 and SC3 WG1 in using the controlled atmosphere cone calorimeter for this purpose.

Status: Completion of revised Rounds 1 and 2 of the round robin on ISO/TS 19700 scheduled for shortly after Lancaster. **Action: Richard Hull**

Plan for a small symposium on the use of the controlled atmosphere cone calorimeter in 10/2010. **Action: Eric Guillaume & Stephen Grayson**.

3. Technical Report on the effect of combustion conditions on effluent components **(SC3 WG2)**

   This document summarizes and interprets the findings of research on the variation of the yields of toxic compounds, visible smoke, and heat with combustion conditions, notably equivalence ratio and possible the chemical composition of the combustible.

   Status: Compilation of sources of data for discussion in Paris. **Action: Not yet assigned.**

4. International Standard on calculation of wall losses of gases and smoke **(SC3 WGx)**

   This document would include the published methods for assessing the decrease in gas and smoke concentrations as a function of distance from the fire. Non-normative annexes would compile the results of tests of wall losses.

   Status: No action yet.

5. Examples of calculations of FED and ASET **(SC3 WG5)**

   This Annex to **ISO 13571** provides examples of the use of the equations within the Standard.

   Status: SC3 WG5 and SC4 WG11 to compile previous examples supplied by Experts. **Action: Examples from Purser and Su; for discussion in 2010/2011.**

6. Technical Report on the sub-incapacitating effects of fire effluent **(SC3 WG5)**

   This document compiles and interprets the published literature on the effects of toxic gases, visible smoke, and heat at levels below those that lead to incapacitation.

   Status: Solicit person to compile data from, e.g., AEGL documents. **Action: Dick Gann.**

7. Compilation of limiting hazard by product type and fire scenario **(SC3 WG5)**

   Status: No action yet.

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SC4

1. Include consideration of tenability conditions in revisions of **ISO/TS 16733 (SC4 WG6) and ISO/TS 16732 (SC4 WG10)**

   For both design fire scenarios and risk assessment, this would be in the form of new examples. In these examples, assumptions on the effects of delay in evacuation or incapacitation (before or during evacuation) would be included.

   Status: Add to examples being developed in SC4 WG6. SC4 WG11 to also be involved. Perhaps use arena case. **Action: Colleen Wade, Dick Gann and David Purser, once arena case is further developed.**

2. Normative document on effects of smoke and toxicants on human behavior and judgment and thus on time required for escape **(SC4 WG11)**

   This would be a follow-on to **ISO/DTR 16738** in **SC4 WG11**. It would include effects of toxicants on movement speed and choices. An annex would include treatment of statistical distribution of behavioral response. This is to be worked in conjunction with SC3 Task 6.

   Status: No action yet, awaiting results of SC3 Task 6.

3. Include consideration of fire effects on people in document on selection and implementation of behavioral scenarios **(SC4 WG11)**

   This would be an extension of **WD 29761.**

   Status: Include in first revision of 29761, if not the first version. **Action: Rita Fahy, Dick Gann.**

4. Technical Report on relative importance of various fire scenarios, including guidance for jurisdictions that do not have fire incidence data compilations **(SC4 WG 10)**

   This document would guide authorities on how to weight fire scenarios, including the likelihood that people would be moving within the occupancy.

   Status: SC4 WG10 will start on this. **Action: John Hall**.

5. International Standard(s) on flame spread algorithms **(SC4 WG9)**

   This Standard would establish criteria for equations and software for calculating fire growth, including changes in equivalence ratio that might affect combustion product yields, as in Item 3 under SC3.

   Status: To be discussed in SC4 WG9. **Action: Kazunori Harada.**

6. International Standard for fire growth capability in zone and CFD models **(SC4 WG7)**

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This Standard would establish criteria for equations for effluent generation and transport models, including changes in equivalence ratio that might affect combustion product yields, as in Item 3 under SC3.

Status: Could be examples of application of ISO/TS 16730. No action yet.

7. International Standard on transport and losses of effluent and effluent components in zone and CFD models **(SC4 WG7)**, using output from Item 4 under SC3.

   Status: Awaiting Task 4 document from SC3. An example could be developed in WG7.

8. Technical Report on approach to grouping finished products by magnitude and nature of effluent potency **(SC3/SC4 WG6)**

   Since, for a single building, there are many combinations of combustible products present, it is unlikely that someone would examine all the possible fire scenarios and use the results to select chairs, carpet, wall coverings, etc. Therefore, this document would describe the basis for identifying products of ordinary burning rate and toxic product yields. It would also describe the basis for determining whether a product should be identified as "not ordinary," depending on the mass of the product, its burning rate, the yields of smoke and/or toxic gases, what other products might be burning at the same time, etc.

   Status: SC4 will discuss this. **Colleen Wade and Dick Gann to coordinate.**

9. Guide to estimating ASET. **(SC3/SC4 WG?)**

   This would be a guide to using all the above documents, along with other appropriate TC92 documents, for estimation of whether people would be able to escape from a fire.

   Status: Could be a joint project between SC3 WG5 and SC4 WG1. No action yet.

CAW GBB

APPENDIX B
ISO/TC 92/SC 4 "FIRE SAFETY ENGINEERING"
RESOLUTIONS
HANGZHOU, CHINA
29TH OCTOBER 2010

Resolution SC4 N206 – Hangzhou 1, 10/10/29 – Revised ISO/TC 92 Business Plan

As proposed by TG 1 in document SC4 N600,

ISO/TC 92/SC 4 agrees its contribution as a proposal for the revision of the ISO/TC 92 Business Plan as given in document ISO/TC 92/SC 4 N610. SC4 asks the secretariat to send this proposal to the Chairman and the Secretariat of ISO/TC 92.

Resolution SC4 N207 – Hangzhou 2, 10/10/29 – Future numbering of SC 4 documents

As proposed by TG 1 in document SC4 N600,

ISO/TC 92/SC 4 agrees to change the numbering of SC 4 documents when further evolution of documents will allow it, as given in the document SC 4 N 611.

Resolution SC4 N208 – Hangzhou 3, 10/10/29 – Launch of a DTR Ballot for ISO/WD 10796-2

As reported by WG 7 in document SC 4 N 603,

Considering that the draft ISO/WD 10796-2 “Fire safety engineering – Examples on verification and validation of a calculation method – Part 2: CFD model” is nearing completion by SC4/WG 7,

ISO/TC 92/SC 4 agrees to designate the document as DTR and to launch the DTR ballot in order to get comments to be considered by WG 7.

Resolution SC4 N209 – Hangzhou 4, 10/10/29 – Launch of a DTS Ballot for ISO/WD 13447

As reported by WG 7 in document SC 4 N 603,

Considering that the draft ISO/WD 13447 “Fire safety engineering – Guidance for the use of fire zone models” is nearing completion by SC4/WG 7,

CAW GBB

ISO/TC 92/SC 4 agrees to launch the DTS ballot in order to get comments to be considered by WG 7.

Resolution SC4 N210 – Hangzhou 5, 10/10/29 – Launch of a NP Ballot for PWI 29761

As proposed by WG11 in document SC4 N606,

ISO/TC 92/SC 4 agrees to ballot a new work item proposal for the preparation of a technical specification on the selection of design occupant behavioural scenarios and design behaviours, including a worked example (PWI 29761).

CAW GBB