



## **SFPE Standards-Making Committee on Calculating Fire Exposures**

### **Meeting Report -- February 1, 2017 (US Eastern Time)**

**Present:** Craig Beyler (Chair), Farid Alfawakhiri, Jonathan Barnett, Sean Hunt, Panos Kotsovinos, Kevin LaMalva, Jason Smart, Collen Wade, Jonathan Weigand, Ulf Wickström and Chris Jelenewicz (staff).

**The purpose of this meeting was to coordinate committee activities between working groups. Each working group leader reported on progress being made. The following was discussed:**

1. **Database Group** – Working group leader Sean Hunt indicated the working group was asked to complete three tasks:
  - a. Review the existing database of test results to identify data quality and revise culling criteria if needed.
  - b. Identify any new fire test data that can be added to the existing database.
  - c. Review the representation of the heat transfer boundary conditions and consider if any changes are needed.

So far the working group held three meetings. New data was collected from about 25 tests and many of these tests reference multiple datasets.

The working group looked at the decision making process for culling data in the original standard. It is in the process of relaxing some of the constraints (i.e fuel, small scale tests). A final decision will be made at the next working group meeting. There were a few concerns about adding data that used gas burner fires. The working group will evaluate if adding gas burner experiment data would impact the evaluation.

The next step will be to determine how the boundary conditions are defined and as a last step the working will look at the predictive models/methods that were evaluated in the original evaluation. ULF has already submitted a new method to the working group to consider.

2. **Exposure Working Group** – Working group leader Ulf Wickström indicated the working group discussed how to express ‘thermal exposure’ on the basis of Brian Lattimer’s chapter in the SFPE Handbook on heat transfer from fires to surfaces and in ULF’s book on temperature calculations in fire safety engineering. At its next meeting the working group will come to a conclusion in regards to expressing how boundary conditions are defined in the standard.

The working group will also focus on building a relation between adiabatic surface temperature and how heat flux is defined. Specifically, the working group will provide guidance on how to draw the best conclusions and understand the uncertainties no matter what method is used. It was indicated that the original standard estimates thermal boundary conditions in terms of the total incident heat flux (120 kw/m<sup>2</sup> or 20 kw/m<sup>2</sup>) at a specific location for an exposure duration. The working group will take another look at these values and determine how to equate to adiabatic surface temp.

3. **Risk Working Group** – Group leader Kevin LaMalva indicated the working group has held three meetings. The working group is looking at developing a risk-informed approach that will focus on estimating maximum temperature, fire duration, decay period and extent of the fire exposure.

The working group examined how NFPA 557 and the Eurocodes estimate fuel load. It was noted that the Eurocodes use risk factors in the calculation of fuel loads.

The working group will also explore how to include the decay period in the standard, as the original standard does not consider the cooling phase (decay period).

Moving forward, the working group is currently looking at three options:

- A. Put an emphasis on fuel loads similar to Eurocode. This would mean submitting code change proposals to the NFPA 557 and adding risk factors to the estimates.
- B. Focus on estimates based on extend of exposure. This would include defining the risk of multi-compartment involvement and multi-floor involvement.
- C. Focus on developing a risk-informed fire curve.

ULF indicated that his book highlights how parametric fire curves compare to test data. Specifically, there is a relationship between maximum temperature and the height of opening. There is also a relationship between heat release rate and opening factor and wall construction.

4. **Traveling Fires** – It was indicated that Barbara Lane could lead a working group that will look at traveling fires. Craig will contact her to confirm. If other committee members are interested in participating in a traveling fires working group they should contact CJ.
5. **Fire Models** – At this time the committee will not look at including information on computer fire models. However, the topic will be discussed at a later committee meeting.
6. **Moving Forward** – The Chair thanked the committee members for making good progress and the group leaders for keeping things moving. The next committee meeting will be scheduled once the working groups have made sufficient progress as determined by the Chair.

**End of Report**