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QUESTIONS FOR THE AAMA SMOKE VENT TASK GROUP

By Richard Schulte

The question of whether the installation of smoke/heat (roof) vents is compatible with sprinkler protection has been an issue in the fire protection field for more than 40 years.

The question of whether the installation of smoke/heat (roof) vents is compatible with sprinkler protection has been an issue in the fire protection field for more than 40 years. The high-piled storage provisions contained in the 1979 edition of the Uniform Fire Code (UFC) mandated the installation of roof vents in unsprinklered buildings, but specifically required the installation of a manually-activated mechanical smoke removal system in buildings protected by a sprinkler system. The reason why the high-piled storage provisions contained in the UFC specifically required the installation of a mechanical smoke removal system in sprinklered buildings, rather than roof vents, was the concern that the opening of roof vents would have an adverse impact upon the operation of the sprinkler system.

Degenkolb's efforts were successful and the high-piled storage provisions contained in the UFC were revised to not only permit the installation of roof vents in sprinklered buildings, but made the installation of roof vents mandatory.

In the early 1980's, the manufacturers of smoke/heat vents retained the services of a building code consultant, John G. (Gus) Degenkolb, to assist in modifying the high-piled storage provisions contained in the UFC to allow the installation of smoke/heat vents in buildings protected by a sprinkler system. Degenkolb's efforts were successful and the high-piled storage provisions contained in the UFC were revised to not only permit the installation of roof vents in sprinklered buildings, but made the installation of roof vents mandatory. This revision to the UFC high-piled storage provisions was made without any testing, documentation or other evidence that the operation of roof vents would not have an adverse effect on the capabilities of sprinkler systems to control fires.

Fast forward to 1994-research conducted by Factory Mutual Research Corporation (FMRC) determined that draft curtains could have an adverse effect on the operation of sprinklers in industrial and storage occupancies where a fire occurs in close proximity to a draft curtain. Fast forward once again to 1998-research conducted at Underwriters Laboratories for the National Fire Protection Research Foundation (NFPRF) determined that sprinkler operation has an adverse effect upon the activation of fusible-link operated smoke/heat vents. Not only that, but a fire at a Home Depot store on March 19 of that same year confirmed both the FMRC research finding on draft curtains and the NFPRF research finding that sprinkler operation has an adverse impact on the operation of roof vents.

Based upon the results of the FMRC and NFPRF research work, a proposal to delete the requirements to install roof vents in buildings protected by a sprinkler included in the last draft of the International Fire Code was introduced into the code change process. In order to prevent this code change proposal from being approved, the Smoke Vent Task Group (SVTG) issued a memorandum announcing a new research study on the interaction of sprinklers and smoke/heat vents on September 10, 1999 and then utilized the announcement in the effort to defeat the proposal to delete the requirements for roof vents in sprinklered buildings. The proposal was defeated at the code hearings held in St. Louis in October 1999 and provisions to mandate the installation of smoke/heat vents in sprinklered buildings were included in the first edition of the International Building (IBC) and Fire Codes (IFC), the 2000 edition.

In order to prevent this code change from being approved, the Smoke Vent Task Group issued a memorandum announcing a new research study on the interaction of sprinklers and smoke/heat vents on September 10, 1999 and then utilized the announcement in the effort to defeat the proposal to delete the requirements for roof vents in sprinklered buildings.

Subsequent to the inclusion of the provisions mandating roof vents in sprinklered buildings in the 2000 edition of the IBC and IFC, four proposals to modify or delete the roof vent provisions have been introduced into the ICC code change process and each of these proposals has been rejected by the ICC membership.

Given the complexity of the issue and the fact that a number of proposals to delete the requirements for roof vents in sprinklered buildings had been submitted, the ICC Code Technology Committee (CTC) voted to form a study group on roof vents as part of the CTC's investigation of the "balanced fire protection" issue at its meeting in Kansas City in October 2006. The Study Group initially consisted of three members, Rick Thornberrry (representing the Smoke Vent Task Group), Richard Schulte and was chaired by a member of the CTC, Carl Baldassarra. In addition, Dr. Craig Beyler was named as an alternate to Thornberry and participated in the Study Group.

The Study Group began its work on the issue in January 2007, but the discussions quickly bogged down. Rather than continue work, it was proposed that the Study Group be disbanded and instead a debate on the issues be held before the CTC. The debate was held at the CTC meeting held in Baltimore in late May 2008 and the discussion was continued at the next CTC meeting held in Chicago in mid November 2008.

Subsequent to the debate at the CTC meeting in Chicago, the Study Group was reconstituted and directed to develop a code change proposal based upon the provisions contained in NFPA 204. Since 2007 edition of NFPA 204 does not contain any specific provisions for the installation of roof vents in sprinklered buildings, the Study Group drafted a code change proposal which referenced NFPA 204 for buildings not protected by a sprinkler system and mandated the installation of a manually-activated mechanical smoke removal system for buildings protected by a sprinkler system. After review and revision by the CTC, the CTC voted to submit the code change proposal developed by Study Group in the 2009/2010 code change cycle. This proposal is referred to as code change proposal F144-09/10 in the roster of proposals.

Subsequent to the inclusion of the provisions mandating roof vents in sprinklered buildings in the 2000 edition of the IBC and IFC, four proposals to modify or delete the roof vent provisions have been introduced into the ICC code change process and each of these proposals has been rejected by the ICC membership.

In the code development hearings held in Baltimore in late October 2009, code change F144-09/10 was approved with amendments. One of the amendments approved was an exception to permit the installation of roof vents in sprinklered buildings when specifically approved by the code official. At the final action hearings held in Dallas this week, the membership voted to disapprove the code change proposal. Hence, the provisions for roof vents contained in the 2012 edition of the International Building Code and the International Fire Code will essentially remain the same as previous editions.

Hence, the provisions for roof vents contained in the 2012 edition of the International Building Code and the International Fire Code will essentially remain the same as in previous editions.

While the ICC Code Technology Committee was in the process of addressing the issue of roof vents, both the National Fire Protection Association (NFPA) and the SVTG were also working on the issue. In the summer of 2006, the SVTG announced that a new research study on the interaction of sprinklers and roof vents utilizing fire modeling would be conducted by Hughes Associates. This research study culminated in a report titled *"Analysis of the Performance of Ganged Operation of Smoke and Heat Vents with Sprinklers and Draft Curtains*" dated February 18, 2008. The report presented the concept of the "ganged" operation of roof vents with the operation (opening) of multiple vents occurring 60 seconds after the activation of the sprinkler system water flow indicating device.

The report presented the concept of the "ganged" operation of roof vents with the operation (opening) of multiple vents occurring 60 seconds after the water flow indicating device in the sprinkler system is activated.

The concept of the "ganged" operation of roof vents constituted most of the Smoke Vent Task Group's presentation in the debate on roof vents before the ICC Code Technology Committee. In the discussion following the debate presentations, the question of whether or not the fire model used in the research, the Fire Dynamics Simulator (FDS), was "validated" for the purposes used in the research, predicting the activation times of multiple sprinklers and the number of sprinklers which will activate. While Dr. Beyler stated that the FDS was "validated" for this purpose, Hughes Associates was unable to provide any documentation to support Beyler's claim. To this date, Hughes Associates has yet to provide any documentation that the FDS was utilized within its accepted range of "validation" and Hughes Associates' research on the "ganged" venting concept is not considered to be credible. In fact, the Smoke Vent Task Group has characterized Hughes Associates' research work on the concept of the "ganged" operation of roof vents as "*worthless*". (See page 32 for a partial transcript of the SVTG's teleconference.)

In fact, the Smoke Vent Task Group has characterized Hughes Associates' research work on the concept of the "ganged" operation of roof vents to be "*worthless*".

Along with the CTC Study Group's work on the issue of the use of roof vents in sprinklered buildings and Hughes Associates' fire modeling study of the concept of the "ganged" operation of roof vents, the NFPA committee on sprinklers systems, the NFPA 13 committee, was also addressing the issue of the use of roof vents in sprinklered buildings. Given the potential that open roof vents may adversely affect the operation of a sprinkler system, provisions which only permit the installation of manually-operated roof vents or automatic roof vents with a fusible element temperature rating one classification higher than the temperature rating classification of the sprinklers used were approved and are now included in the 2010 edition of NFPA 13.

The purpose of the new provisions in NFPA 13 is to prevent the early operation of roof vents so that the opening of roof vents will not interfere with the activation of sprinklers in the early stages of the control of the fire by the sprinkler system. This new provision in NFPA 13 basically means that roof vents will perform no function if the sprinkler system operates successfully.

The rationale for making this statement is that roof vents depend upon the buoyancy of hot gases to perform their function. The longer the opening of vents is delayed, the greater the reduction in the temperature of the fire gases caused by the sprinkler spray discharge. In other words, since sprinklers are highly effective in reducing ceiling temperatures, the operation of sprinklers reduces the temperature of the layer of fire gases which collects at the ceiling, which, in turn, impairs or prevents the venting of smoke through open roof vents.

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Discussion

With the background above, it seems reasonable to ask that the Smoke Vent Task Group (and their consultants) answer some tough questions about the use of smoke/heat vents in buildings protected by sprinklers. Here are some of the questions:

> **Question 1:** In the spring of 1999, Dr. Craig Beyler, an expert for the plaintiffs in the litigation referred to as Ian David McAuslin, et al v. Grinnell Corporation, et al (the McFrugal's Warehouse fire in New Orleans) testified in his deposition that the LES3D fire model was capable of accurately predicting the activation times of multiple ceiling sprinklers, the number of ceiling sprinklers which would operate and the effects of the ceiling sprinkler discharge on fires which occur storage racks. Dr. Beyler further testified in his deposition that the capability of the LES3D model to predict this information accurately had been "validated". When the "validation" of the Fire Dynamics Simulator to accurately predict the activation times of multiple ceiling sprinklers and the number of ceiling sprinklers that would activate was questioned in his presentation to the ICC Code Technology Committee in 2008, Dr. Beyler was unable to provide any supporting documentation on his assertion that the FDS has been "validated" for these purposes. Why was Dr. Beyler unable to provide documentation to support his assertion regarding "validation" of the Fire Dynamics Simulator with respect to sprinkler activation times and number of sprinkler activations in 2008 when Dr. Beyler asserted that these capabilities were "validated" in sworn testimony in his deposition in 1999?

Question 2: In September 1999, the chairman of the Smoke Vent Task Group, Paul Simony, made a commitment to conduct additional research on the interaction between sprinklers, roof vents and draft curtains. After almost 11 years, the additional research promised by the chairman of the Smoke Vent Task Group has yet to commence. Why has the research program on the interaction between sprinklers, roof vents and draft curtains announced more than a decade ago not been conducted as promised?

Why was Dr. Beyler unable to provide documentation to support his assertion regarding validation of the Fire Dynamics Simulator with respect to sprinkler activation times and number of sprinkler activations when Dr. Beyler asserted that these capabilities were "validated" in sworn testimony in his deposition in 1999?

Question 3: In the Summer 2006 issue of the American Architectural Manufacturers Association (AAMA) newsletter, the Smoke Vent Task Group announced a research study of the interaction between sprinklers, roof vents and draft curtains using fire modeling, rather than fire testing. The announcement indicated that the purpose of this new study was *"to concretely demonstrate the value of S&HV in terms of property protection, occupant safety, firefighter safety, and firefighter effectiveness".* In the minutes of a teleconference held on March 24, 2009, the AAMA Smoke Vent Task Group indicated that the research study conducted by Hughes Associates was "*worthless*" if Dr. Craig Beyler would not "*defend the Modeling Study*". If Hughes Associates' research on the interaction between sprinklers, roof vents and draft curtains is "*worthless*", why hasn't the AAMA Smoke Vent Task Group announced that the research failed to "*demonstrate the value of S&HV in terms of property protection, occupant safety, firefighter safety and firefigthter effectiveness*"?

Why has the research program on the interaction between sprinklers, roof vents and draft curtains announced more than a decade ago not been conducted as promised?

Question 4: At the ICC Code Technology Committee (CTC) meeting held in Birmingham in April 2009, William Koffel, a former president of the Society of Fire Protection Engineers (SFPE) and a consultant who represents the Smoke Vent Task Group on the NFPA Smoke Management Committee, stated that smoke/heat vents "work" in buildings protected by a sprinkler system. How does Mr. Koffel define the term "work" that he used at the CTC meeting in Birmingham and what is the technical basis for his opinion that roof vents "work" in sprinklered buildings?

Question 5: Section A.11.5 in the 2007 edition of NFPA 204 includes sentences which read as follows:

"*This specification of the design fire assures that the vent system will be effective under the most challenging fire conditions consistent with successful sprinkler system operation. Note that smoke vents will not be effective in removing fully cooled gases that have no residual buoyancy.*"

The provisions addressing the use of smoke/heat vents contained in the 2010 edition of NFPA 13 require that the vents either be manually operable (only) or be automatically-activated by a fusible element with a temperature rating which is one temperature classification higher than the temperature classification of the sprinklers. Given the NFPA 13 requirements for the use of smoke/heat vents in buildings protected by a sprinkler system, it is unlikely that any smoke/heat vents will operate with "*successful sprinkler system operation*" until the vents are manually opened by fire fighters.

The most recent NFPA study on the reliability of sprinkler systems (February 2010) indicates that 69 percent of fires are controlled by the operation of 1 or 2 sprinklers in manufacturing and storage buildings protected by a wet sprinkler system and that 89 percent of fires are controlled by the operation of 5 or fewer sprinklers. Given that the response time of fire departments in the US typically averages between 5 and 7 minutes (at best), it is highly probable that the smoke generated by fires in industrial and storage buildings protected by sprinklers will be "*fully cooled gases that have no residual buoyancy*" by the time the fire department arrives.

Given that the response time of fire departments in the United States typically averages between 5 and 7 minutes (at best), it is highly probable that the smoke generated by fires in the industrial and storage buildings protected by sprinklers will be "*fully cooled gases that have no residual buoyancy*" by the time the fire department arrives.

If the smoke in an industrial or storage building typically consists of "*fully cooled gases that have no residual buoyancy*" at the time the fire department arrives, it would appear that smoke/heat vents are useless in most fires which occur in these types of buildings (because the roof vents provided must be manually opened by firefighters). Given this, what is the purpose of providing smoke/heat vents in buildings protected by a sprinkler system?

The questions above are not intended to be "trick" questions, but have been asked simply to elicit pertinent information regarding the issue of the use of roof vents in buildings protected by a sprinkler system. Even so, it is highly unlikely that the Smoke Vent Task Group, or any of its consultants, will venture to address any of these questions simply because the answers are rather embarrassing.

With respect to the "validation" of the Fire Dynamics Simulator for purposes of (accurately) predicting the activation times of multiple ceiling sprinklers, the number of ceiling sprinklers which will activate and the effects of sprinkler spray discharge, it is well-known in the fire protection field that the capability of the FDS to accurately make these prediction is beyond the capabilities of the model even in 2010. This means that Dr. Beyler's sworn testimony in his deposition in 1999 was erroneous. Either Dr. Beyler isn't the acknowledged expert on fire modeling which many in the profession believe him to be or Dr. Beyler didn't tell the truth, *i.e.*, he lied, in his 1999 deposition and in his presentations to the Code Technology Committee.

. . .it is well-known in the fire protection field that the capability of the FDS to accurately make these prediction is beyond the capabilities of the model even in 2010.

It is my opinion that Dr. Beyler is indeed an expert in the field of fire modeling, which, of course, leads to only one conclusion-Dr. Beyler deliberately misstated the extent of the "validation" of the FDS in both his sworn testimony in 1999 and in his statements to the Code Technology Committee. Given this, one has to wonder how many other times Dr. Beyler has utilized the Fire Dynamics Simulator outside the range of its "validation" and was never questioned on the credibility of the results of his modeling work.

It is my opinion that Dr. Beyler is indeed an expert in the field of fire modeling, which, of course, leads to only one conclusion-Dr. Beyler deliberately misstated the extent of the "validation" of the FDS in both his sworn testimony in 1999 and in his statements to the Code Technology Committee.

In regards to the Smoke Vent Task Group's commitment to conducting further research and testing on the interaction between sprinklers and roof vents in September 1999, it seems rather obvious why no further research work was conducted. There simply was no need to conduct further research since the proposal to eliminate the requirements for roof vents was defeated. In other words, it is my opinion that the Smoke Vent Task Group memorandum was simply a ruse to be used in testimony at the ICC code development hearings held in October 1999 and there was never any intention of doing this research work unless the provisions which mandate the installation of roof vents in sprinklered buildings were removed from the code.

Certainly, it's more than a little embarrassing for both the Smoke Vent Task Group and Hughes Associates, Inc. to herald a research study as being the definitive answer to questions regarding the interaction of sprinklers and roof vents in 2006 and then 3 years later have to admit that the study is "*worthless*", but clearly the fact that the research study was a failure should have been announced given that the research study had been previously publicly touted by both the SVTG and Hughes Associates as being credible. In my opinion hiding the fact that the Hughes Associates' study is "*worthless*" calls into question the integrity of both the Smoke Vent Task Group and Dr. Craig Beyler, particularly when this is compounded with making false statements regarding the "validation" of a fire model in sworn testimony in litigation.

Certainly, it's more than a little embarrassing for both the Smoke Vent Task Group and Hughes Associates, Inc. to herald a research study as being the definitive answer to questions regarding the interaction of sprinklers and roof vents in 2006 and then 3 years later have to admit that the study is "*worthless*". . .

William Koffel's statement that smoke/heat vent "work" in sprinklered buildings is rather interesting from the perspective of the discussion of the issue of the use of vents in sprinklered buildings. If Koffel has credible data, testing and research that smoke/heat vents "work", why didn't the consultants for the SVTG, Thornberry and Beyler present that information to the Roof Vent Study Group two years ago? Given that no credible documentation was submitted by any of the consultants for the SVTG, it seems reasonable to assume that the documentation doesn't exist, and, if that's the case, then it is my opinion that Koffel's statement is just one more example of a lack of credibility and integrity on the part of the smoke/heat vent manufacturers and their consultants.

Section A.11.5 in the 2007 edition of NFPA 204 specifically states that smoke/heat vents in sprinklered buildings should be designed assuming "*successful sprinkler system operation*".

It would seem that the most damning question regarding the use of smoke/heat vents in sprinklered buildings is the last question. Section A.11.5 in the 2007 edition of NFPA 204 specifically states that smoke/heat vents in sprinklered buildings should be designed assuming "*successful sprinkler system operation*". Based upon this assumption, it can concluded that no roof vents will automatically open or be manually opened prior to the arrival of the fire department. If this is the case, and it is, then the question of whether or not smoke/heat vents will "work" depends upon the temperature of the fire gases which collect under the roof of the building.

The thermocouple data from the five large-scale fire tests which were part of the UL/ NFPRF research included in the NISTIR 6196-1 report, clearly show just how rapidly ceiling temperatures are reduced after sprinkler activation. (This ceiling temperature data is shown in Figure 24 (page 40), Figure 27 (page 44), Figure 30 (page 48), Figure 33 (page 52) and Figure 36 (page 56) in NISTIR 6196-1 (dated September 1998).) Based upon the data from these five tests, it can be stated that the average ceiling temperature will be near ambient temperature at the time of the arrival of the fire department and certainly by the time fire fighters go to the roof and manually open the vents. With the average ceiling temperature near ambient prior to the opening of any vents, the "*smoke vents will not be effective*" as stated in section A.11.5 in NFPA 204 (2007 edition).

The thermocouple data from the five large-scale fire tests which were part of the UL/ NFPRF tests included in the report on this research, NISTIR 6196-1, clearly show just how rapidly ceiling temperatures are reduced after sprinkler operation.

While Koffel is correct in pointing out that the temperature rating of the sprinklers used in these five full-scale tests referred to in the previous paragraph was 165°F and that NFPA 13 not only permits, but encourages the use of high temperature (286°F) sprinklers, the ceiling temperatures shown in the thermocouple plots are so low that the use of high temperature sprinklers will have little effect upon the conclusion that "*smoke vents will not be effective*" because the "*cooled gases*" will "*have no residual buoyancy*".

. . .the ceiling temperatures shown in the thermocouple plots are so low that the use of high temperature sprinklers will have little effect upon the conclusion that "*smoke vents will not be effective*" because the "*cooled gases*" will "*have no residual buoyancy*".

Given the above, it seems fairly obvious that William Koffel's assertion that roof vents "work" in buildings protected by a sprinkler system is highly questionable at best (assuming that the common definition of the term "work" as applied to vents is used). Perhaps Koffel's assertion may have been correct with sprinklers manufactured in the 1970's, link and lever sprinklers with fusible links with a relatively small surface area to mass ratio, but certainly not with the sprinklers manufactured for the last 20^{+} years.

Conclusion

It has been documented that Dr. Craig Beyler erroneously stated that the LES3D fire model was capable of accurately predicting the activation times of multiple ceiling sprinklers, the number of ceiling sprinklers which will activate and the effect of ceiling sprinkler spray discharge on a fire in rack storage configuration in sworn testimony in an expert deposition in the litigation referred to as Ian David McAuslin, et al v. Grinnell Corporation, et al in 1999. Not only that, Beyler stated that capability of the fire model to accurately predict this information was "validated" in his sworn testimony in this same deposition. (See the documentation on pages 13-29.)

Perhaps Koffel's assertion may have been correct with sprinklers manufactured in the 1970's, link and lever sprinklers with fusible links with a relatively small surface area to mass ratio, but certainly not with the sprinklers manufactured for the last 20^{+} years.

Further, the Smoke Vent Task Group announced a research study on the interaction of sprinklers and smoke/heat vents on September 10, 1999, but has yet to follow through on this commitment. In the summer of 2006, the Smoke Vent Task Group once again made a commitment to do further research on the interaction of sprinklers and smoke/heat vents using a fire modeling approach. This time the commitment to do further research was honored, however, the research work done by Hughes Associates has been characterized as "*worthless*" by the Smoke Vent Task Group.

Another consultant retained by the Smoke Vent Task Group, William Koffel, a former president of the Society of Fire Protection Engineers, has stated that smoke/heat vents "work" in sprinklered buildings, but has neither defined what he means by the term "work", nor has he provided any documentation to support his opinion.

Based upon the documentation provided above, it my opinion that the Smoke Vent Task Group and the consultants that the SVTG has retained, Beyler, Koffel and Thornberry, have been involved in an extensive disinformation campaign about the use of smoke/heat vents in buildings protected by a sprinkler system. If this is not the case, then it would seem that the Smoke Vent Task Group or its consultants wouldn't mind answering the questions raised above.

If both Beyler and Koffel don't want to show us the documentation to support their assertions, perhaps their assertions on smoke/heat vents can be best described as "*worthless*".

If Beyler has documentation that the LES3D/Fire Dynamics Simulator model has been "validated" for the purposes that he used them in his expert report on the McFrugal's Warehouse fire (Ian David McAuslin v. Grinnell Fire Protection Systems Company et. al.) and in the Hughes Associates' research on the concept of the "ganged" operation of roof vents, let's see it. If Koffel has documentation that roof vents "work" in sprinklered buildings, again, let's see it. If both Beyler and Koffel don't want to show us the documentation to support their assertions, perhaps their assertions on smoke/heat vents can be best described as "*worthless*".

* * * * *

Editor's Note: Excerpts of Dr. Craig Beyler's testimony in the litigation referred to as Ian David McAuslin, et al v. Grinnell Corporation, et al have been attached along with the supporting documentation that Beyler's assertions regarding the "validation" of the LES3D/Fire Dynamics Simulator model are erroneous. See pages 13-29.

Also attached are excerpts minutes from a Smoke Vent Task Group teleconference which characterizes the research work on the concept of "ganged" roof vent operation done by Dr. Craig Beyler/Hughes Associates, Inc. as "*worthless*".

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August 20, 2009

Mr. Morgan Hurley
Society of Fire Protection Engineers
7315 Wisconsin Avenue, Suite 620E
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Re: SFPE Ethical Standards
Dr. Craig Beyler

Dear Mr. Hurley:

Canon 12 of the SFPE Canon of Ethics requires that members of the Society provide information to the Society regarding potential violations of the SFPE Canon of Ethics. Although I am not a member of SFPE, I am providing information regarding potentially unethical conduct by Dr. Craig Beyler in the litigation arising from the fire which destroyed McFrugal's Warehouse in New Orleans to the Society in conformance with Canon 12.

The SFPE Canon of Ethics includes the following statements:

> *"**Preamble**. . . .Accordingly, the services provided by fire protection engineers require honesty, impartiality, fairness and equity, and must be dedicated to the protection and enhancement of the public safety, health and welfare; and the environment. In the practice of their profession, fire protection engineers must maintain and constantly improve their competence and perform under a standard of professional behavior which requires adherence to the highest principles of ethical conduct with balanced regard for the interests of the public, clients, employers, colleagues, and the profession.. . ."*
>
> "***Fundamental Principles.** Fire protection engineers uphold and advance the honor and integrity of their profession by: . . . .Being honest and impartial, and serving with fidelity the public, their employers, and clients. . . "*
>
> "***Canon 6.** Fire protection engineers shall be honest and truthful in presenting data and estimates, professional opinions and conclusions, and in their public statements dealing with professional matters . . . "*

Attachment 1 to this letter includes an excerpt from page 18 of a paper authored by Dr. Craig L. Beyler and Leonard Y. Cooper titled "*Interactions of Sprinklers with Smoke and Heat Vents*" dated February 1999. A copy of this paper was obtained from the Hughes Associates, Inc. (HAI) website approximately 3 years ago. This paper is referred to as Paper 21 on the HAI website.

Based upon Dr. Beyler's statements in his deposition as a plaintiffs' expert in the litigation resulting from the fire at the McFrugal's Warehouse in New Orleans, Paper 21 was developed for the AAMA Smoke Vent Task Group subsequent to the publication of the final report on testing of the interaction of smoke/heat vents with standard spray sprinklers at Underwriters Laboratories (UL) for the National Fire Protection Research Foundation (NFPRF) in 1997/1998. (The report on the UL/NFPRF tests is titled "Sprinkler, Smoke & Heat Vent, Draft Curtain Interaction -- Large Scale Experiments and Model Development" and is dated September 1998. This report is referred to as NISTIR 6196-1.)

In the excerpt from Paper 21 , Beyler and Cooper state that "the model [referring to Version 1 of the FDS] was unable to predict the corresponding results in the rack storage tests [conducted in the UL/NFPRF tests] beyond first sprinkler activation". Concurrently, or shortly after the publication of Paper 21, Dr. Beyler developed his plaintiff's expert report in the McFrugal's Warehouse fire litigation and within 4 months of the publication of Paper 21 was deposed in this litigation. Excerpts from Dr. Beyler's expert report and from his deposition in the McFrugal's litigation are included in Attachments 3 and 4 to this letter.

The excerpts from Dr. Beyler's expert report and deposition in the McFrugal's Warehouse litigation contradict the statement regarding the capabilities of Version 1 of the Fire Dynamics Simulator made in Paper 21. In Dr. Beyler's expert report and deposition, Dr. Beyler clearly implied that the LES3D model is capable of accurately predicting the activation times of ceiling sprinklers, the total number of ceiling sprinklers which will activate and the effect of the ceiling sprinkler discharge on fire growth. Further, Dr. Beyler asserted that the capability of the LES3D model to accurately make these predictions was "validated".

Given the contradictions in Dr. Beyler's statements regarding the capabilities of the FDS/LES3D model made essentially concurrently in two different venues, it appears to me that it is evident that Dr. Beyler has violated the ethics provisions which require that "*fire protection engineers . . . be honest and truthful in presenting data and estimates, professional opinions and conclusions, and in their public statements dealing with professional matters*". There is no doubt in my mind that Dr. Beyler's assertions regarding the "validation" of the LES3D model in sworn testimony in 1999 were erroneous given that there is presently near unanimous consensus that the capabilities of the FDS to accurately predict the effect of sprinkler discharge on a fire in ordinary combustibles has not been "validated". It is my opinion that this can only lead to one of two conclusions-either Dr. Beyler is not the expert in fire modeling which he purported to be in 1999, or that Dr. Beyler knowingly provided false testimony in his deposition in the McFrugal's litigation. Whichever conclusion is correct, it seems obvious to me that Dr. Beyler has violated the provisions of Canon 6.

Based upon my recent experience with the application of its Canon of Ethics by the SFPE (in my previous two complaints against Dr. Beyler regarding statements regarding the "validation" of the FDS in his presentations to the ICC Code Technology Committee), this letter should **not** be construed to be an ethics complaint against Dr. Beyler. As presently constituted, I have no confidence that the SFPE will enforce its ethics code in matters involving Dr. Beyler and the issue of "validation" of fire models. I will leave it up to the SFPE to conduct its own investigation into this matter if the Society so wishes, however, it is my intention to make public this letter along with the attachments. It should be noted that Canon 12 of the SFPE gives the Society the authority to conduct its own investigation into ethics violations, while individual members and non-members have no such authority to request information from other members of the Society. Hence, it is practically impossible for any ethics complaint to be proven (unless the SFPE conducts an investigation).

With respect to whether or not the issue of "validation" is simply a "technical issue" not subject the standards set forth in Canon 6, it is my opinion that where there is any question regarding the "validation" of a fire model, or portion of a model, the user of the model is required to disclose that the "validation" of the model is questionable in any technical presentation. Failure by any user of a model to comprehensively address the issue of "validation" and to disclose that the "validation" of a model may be questionable in a presentation should be considered to be *prima facie* evidence that a violation of Canon 6 has occurred. While knowledgeable individuals in the field of fire protection can certainly disagree on the issue of "validation" of a model, failure to disclose the fact that there is disagreement on the issue of "validation" seems to me to be both intentionally dishonest and unethical.

I will be more than happy to cooperate with the SFPE in any ethics investigation of Dr. Beyler's conduct in his testimony in the litigation involving the fire at the McFrugal's Warehouse and, as proposed in the previous two complaints, will be more than happy to appear before the SFPE Ethics Committee to provide additional information and answer questions regarding the above.

Given that it is my opinion that Dr. Beyler appears to be willing to contradict himself in different venues whenever and wherever required to represent clients of Hughes Associates, Inc., I would hope that SFPE would take this information regarding Beyler's ethical lapses in the McFrugal's Warehouse litigation seriously for the good of the fire protection profession. Once again in my opinion, providing false testimony or disinformation regarding the capabilities and "validation" of the FDS in the context of litigation (i.e. sworn testimony) is an extremely serious matter which should be dealt with firmly (and harshly) by the SFPE.

Yours Very Truly,

Richard C. Schulte
Schulte & Associates

attach.

cc: Allan Freedman, SFPE
Richard Davis, FM
J. Quiter, Arup
S. Sunder, NIST BFRL
K. McGrattan, NIST BFRL

ATTACHMENT 1

BEYLER/COOPER PAPER (PAPER 21) EXCERPT
FEBRUARY, 1999

The following excerpt is from a paper titled "Interaction of Sprinklers with Smoke and Heat Vents" authored by Craig L. Beyler and Leonard Y. Cooper dated February, 1999:

> ". . . . While there have been many attempts to model all or part of the interactions of sprinklers and vents, the issues are more complex than can be dealt with using even the most sophisticated modeling methods available today [1999]. The most clear indication of this is the recent NFPRF research project. While modeling of the fluid mechanical aspects of the problem were quite successful in predicting aspects of sprinkler activation in the first heptane spray fire series, the model was unable to predict the corresponding results in the rack storage tests beyond first sprinkler activation. . . ." (Page 18)

ATTACHMENT 2

McGRATTAN STATEMENTS
MODEL VALIDATION

The following are Dr. Kevin McGrattan's comments regarding the "validation" of the Fire Dynamics Simulator used for the purposes of predicting the activation times of sprinklers. These comments were posted on the FDS/Smokeview Bulletin Board on February 17, 2009 by Dr. McGrattan.

> "The purpose of the FDS Validation Guide is to present comparisons of FDS predictions against full-scale measurements. We work very hard to present the data in a form that enables those who use FDS, or those who are thinking of using it, to decide for themselves if the model is appropriate for a given application. We do not believe that our role is to say whether or not the model is appropriate because we cannot be sure about what the application could potentially be or what the required level of accuracy should be. We prefer that people use their own judgment to decide what is the best tool for the job. That is essentially what you are doing [referring to Schulte]. You are making an argument that the model is not sufficiently accurate to predict multiple sprinkler activation. We do not want to make such a statement because we don't know exactly what you intend to use the model for, and furthermore, there is no consensus metric in fire protection engineering by which a model is considered validated or not for a particular application. We prefer to do the technical work in developing the model and quantifying its accuracy as we have done in the Validation Guide. We prefer to leave the decision about validation up to you. We even provide you with this forum by which you and others can discuss the merits of the model for this and other applications. We make the source code available for those who want to check the model themselves, or publish their results in the open literature. We feel that an open discussion of model strengths and weaknesses is healthy, and we do everything we can to promote it.

In that spirit, let me point out the second plot in Figure 6.2. Throughout the Validation Guide, there are scatterplots similar to those shown here, except all the other scatterplots have off-diagonal lines that represent the estimated experimental uncertainty. All large scale fire experiments have a considerable amount of uncertainty in the reported heat release rate, environmental conditions, sprinkler characteristics (like droplet size, RTI, etc), and various other parameters that are input into the fire model. Because of the complexity of the experiments and simulations of fires in large warehouse-type facilities, especially those involving multiple sprinkler activations, we do not have a good way (yet) of quantifying the experimental uncertainty. It might be as hard to do that as to predict the experimental results themselves. So rather than try to quantify the experimental uncertainty, we have added the second plot in Figure 6.2. In the UL/NFPRF test series, Phase I, there were 22 experiments, all involving a heptane spray burner and a heat release rate of approximately 4.4 MW. Of those 22 tests, there were three replicate tests (Tests 1 and 8, Tests 4 and 7, and Tests 9 and 10). These were not designed as replicates, but in each case, a vent was either closed for the duration or did not activate, making the two tests essentially the same. The second plot in Fig. 6.2 compares the measured activation times for the sprinklers in one test against the measured activation times in the other (replicate) test. This is only comparing one experiment against another. This has nothing to do with FDS. For example, in Test 8, four sprinklers activated at about 4.5 min after ignition whereas in Test 1, these same four sprinklers activated after about 2 min. There was even a sprinkler that activated after 6 min in Test 8 and after about 2.25 min in Test 1.

This information tells us something about the reproducibility of large scale sprinkler experiments. It is not an indictment of the testing lab, UL, because this sort of behavior is not surprising for those who do this sort of testing. I observed these experiments, and I noted that following the first activation, there was a considerable effect on the fire because these sprinklers release about 1 gallon of water per second. The burner was placed exactly between four sprinklers [in] each test, and because there is some variability in the activation temperature of a real sprinkler, there was usually one sprinkler that activated a few seconds before the others, which caused the fire, the plume, and the subsequent activations to trend in a particular direction. FDS has no such bias -- the sprinklers in these calculations were programmed to activate at exactly 74 C (165 F). I suppose that we could build in a random component to the activation temperature to mimic reality, but we worry that this would simply add an additional uncertainty to an already complicated problem. We prefer that the model produce a result that, on average, compares favorably with a number of replicate tests. The fact that FDS sometimes over-predicts and sometimes underpredicts the number of activations is a good thing. Our goal is to predict the total number of activations and the average activation time of each "ring" of sprinklers. We are less concerned about one or two outliers because we know that there is a randomness to this kind of experiment that simply cannot be predicted.

This kind of information is part of what goes into deciding if the model is appropriate for your purpose. It is my job to provide you with as much information as I can so that you can make an informed judgment. But it is not my place to tell you that the model is right for you. You decide. Ask me questions about the data if something is not clear. But I hope you understand that I simply cannot make a blanket statement like “FDS is validated for predicting multiple sprinkler activations.” You have made an argument above that it is not, and you have every right to that opinion.”

ATTACHMENT 3

EXPERT REPORT EXCERPTS
DR. CRAIG BEYLER DEPOSITION
IAN DAVID McAUSLIN, et al v.
GRINNELL CORPORATION, et al
NEW ORLEANS DISTRIBUTION CENTER FIRE
(McFRUGAL'S WAREHOUSE)

The following are excerpts from Dr. Craig Beyler's expert report in the litigation arising from the fire at McFrugal's Warehouse in New Orleans:

> "In a recent study sponsored by the NFPA Research Foundation, LES3D was used to predict the interaction between sprinklers and heptane spray fires. The sprinkler activation times predicted by LES3D compared well against the heptane spray fire experiments done at Underwriters Laboratories for the same study. First ring sprinkler activation times were predicted to within about 15 percent, and second ring sprinklers activation times were predicted to within about 25 percent. Predictions of the total number of sprinklers activated by the spray fires were generally very good with most predictions within 25 percent with greater deviations in three of the 21 tests. " (Page 16)

> "You and Kung (1984) and Kung, You and Spalding (1986) showed that the plumes and ceiling jets resulting from rack fires can be described using formulations presented in Beyler (1986) for simpler beds. This means that a simple representation of the burning racks as a simple surface at the top of the rack is a valid means of specifying the fire for use in performing calculations of the interaction of rack fire plumes/ceiling with the sprinkler spray." (Page 17)

> "For this study, the data in Beyler (1977b) were used for this purpose. The mean drop size, initial velocity, and water flow rate are dependent on the sprinkler pressure and orifice diameter. The experiments (Beyler, 1977b) used for establishing the parameters were 12.7 mm (½ inch) sprinklers flowing at 114 lpm (30 gpm). The median size was not reported in that work and a value of 1 mm was used based on the work of You (1986)." (Pages 25 and 26)

> "The standard clearance fire caused activation of four sprinklers over a period of 100 to 350 seconds. The MacFrugal's NODC clearance resulted in a fire that activated nearly 70 sprinklers during the simulation and clearly did not control the fire." (Page 41)

"The modeling results provided in this report confirm that the excessive ceiling clearance in the NODC sprinkler design caused the failure of the sprinkler system." (Page 44)

"The graphs on this page indicate the estimated operating times of sprinklers for a fire in a Class II commodity which is three tiers high with top of storage to ceiling clearances of 10 feet and 50 feet." (Page 62)

"The graph for the 10 feet clearance indicates that the first operating sprinkler will activate in approximately 100 seconds and that the fire will be controlled by a total 4 operating sprinklers." (Page 62)

"The graph for the 50 feet clearance indicates that the first operating sprinkler will activate in approximately 215 second and that the fire will not be controlled and will continue to grow." (Page 62)

ATTACHMENT 4

DEPOSITION EXCERPTS
DR. CRAIG BEYLER DEPOSITION
IAN DAVID McAUSLIN, et al v.
GRINNELL CORPORATION, et al
NEW ORLEANS DISTRIBUTION CENTER FIRE
(McFRUGAL'S WAREHOUSE)

The following are excerpts from Dr. Beyler's deposition on May 12, 1999:

Page 418

Q. If I understood your response, the model does not include or can't determine what goes on within the rack itself. Is that correct? Did I repeat what you had stated earlier accurately?

A. You may have, but I'll make a comment on it, not because you mis-characterized it, but because I made it clear to me that I didn't describe it very well.

Q. Okay.

A. The computational domain does not include the racks themselves. That does not mean that we aren't predicting or otherwise know what's going on within the racks, but that is done as a sub-model as opposed to being a part of the - - fluid mechanics domain. What has been done is the fluid mechanics domain starts at the top of the racks up to the ceiling, of course. We predict using the LES model how much water arrives at the top of the racks and we use other models to establish, one, how the fire grows within the racks, and to, what the effect of that water is. So they are - - they are modeled, but they are not modeled in the fluid dynamical part of the LES 3D.

Q. Which portions are they modeled in and what sub-programs or models are those two phenomenon?

A. Those sub-models are a fire growth model that's described subsequently in the report as well as the effect of water is. There's a sub-model for that that we added for that. Both of those are - - We'll talk about them in detail, I'm sure. Both of those come out of work done at Factory Mutual.

Q. And the effect of the size of the flue does have an effect or is part of that equation, is it not?

A. The - -

Q. If you change the flue size, it will change the outcome?

A. The testing that was done that supports those sub-models were with the standard six-inch flue spaces and, yes, there is a - - there is an effect of flue space width on, you know, the air flow through the commodity.

Page 423, Line 3

Q. Let's mark that as 34 then. And let the record reflect the correction to Exhibit 34. Now, with respect to the Yao and Chan articles, your purpose was to discuss RDD and ADD?

A. Yes. Basically the modeling approach that we adopted that I just described in terms of dealing with the domain only above the commodity is the same approach that's inherent in the ADD-RDD or RDD-ADD concept that Factory Mutual has been using I'm going to say a couple of decades, but I'm not absolutely sure, in terms of how they have conducted experimental programs to understand the interaction of sprinklers and fires. They in fact have reduced it, I don't mean reduced in the sense of diminish, but reduced it that is, developed it to the point where it's actually a standard type of a test that they use to establish the commodity classification of some commodity that may not have been tested previously or for whatever reason they have some doubt as to how it's expected to burn. So the intention of including these here is simply to indicate that this is not an approach without precedent. It is the underlying basis for a whole body of research that Factory Mutual has done over the years. And obviously if the prior references we talked about, You and Kung and Kung, You and Spaulding, if those weren't true they wouldn't be doing it. But in fact, they have been and have been successful.

Page 430, Line 21

Q. Okay. Now we pick up the first - - Is this, on page 19, the first of the algorithms that were imported into the program. Is that what that is at the top of page 19?

A. Yeah. What we're doing in this part is describing how we're going to model the commodities in terms of surface areas and then we'll go on in the subsequent page to burning rate per unit areas and then subsequently into flame spread rates, which are the things that are needed to - - that's the fire growth model. And, you know, which are coming out, as we're seeing here, as out of data in correlations of data provided by various authors at Factory Mutual.

Page 450, Line 1

Q. And then explain the significance, the role of Exhibit 42.

A. Sure. Bert did experiments in which he looked at a range of sprinklers and looked at the drop size distributions that were produced and correlated those drop size distributions. This is a report of that work. And you will find that equation 13 is included in Bert Yu's work as a means of correlating the mean droplet diameter to the flow rate and we are using this correlation. So as the flow rate from the sprinkler diminishes, as more sprinklers are activated, not only does the flow rate change, which we have produced in our modeling input, but also the mean droplet size changes, and that is also reflected through the use of this correlation developed by Bert Yu in Exhibit 42.

Page 490, Line 14

Q. Would you be able to model that by use of a different program or do you have to make a qualitative decision, non-quantitative decision as to the effect of the water discharged by the sprinklers in the rack?

A. I mean the substance of the meaty, you know, the meaty part, the central portion of this, our report, are the modifications that we made to LES to allow the modeling of the effect of sprinkler sprays on the burning of the commodities. We added that, we used that. What we did would be - - is applicable to ceiling sprinkler systems, and as indicated yesterday and again today, that I don't know how to expand that to in-rack sprinklers.

The following are excerpts from Dr. Beyler's deposition on June 23, 1999:

Page 1345, Line 24

Q. Okay. I thought it was clear from the content what we were referring to, and if there are multiple reports, I readily stand corrected. But I thought it was clear it was the report that you and Mr. Trelles worked on . Where there more than one report that you worked on for the AAMA?

A. The review paper that I did with Mr. Cooper was also funded by that organization.

Page 1352, Line 25

Q. Did you, in your review of the inventory, and by you, I am referring to the imperial you, determine whether or not any aerosols or flammable liquids were present in the warehouse?

A. Don't know.

Q. Do you recall whether anyone else that was part of the Lloyd's team made that determination or came to that conclusion or did that identification?

A. Don't know.

Q. Did you receive any documents from Mr. Mazarat that would indicate whether or not there were aerosols present in the warehouse?

A. Don't remember. I mean we have reviewed the materials I got from him. I don't remember what those are. We could review any of those that were made exhibits, but I don't remember as I sit here.

Q. Your understanding is, to the extent that there were aerosols present within the warehouse, that was contrary to the variance? Is that correct?

A. Yes.

Page 1359

Q. Okay. Multi-row. That is you had that configuration and the same design for the overhead as was at the warehouse, that the overhead, if it was ten feet or less above the top of storage, would control that fire? Is that correct?

A. That's what the modeling indicated.

Q. That's what the model indicates.

A. Yes.

Q. Okay.

A. That is the prediction.

Page 1397, Line 20

Q. This is still a point where I am a little bit confused and I need you to assist me if you would. Are the fire growth rate and suppression algorithms used in your model based upon tests and experiments done on double row racks or multi-row racks?

A. The two configurations of tests that were used in the testing, as I best remember them, some were arrays of four racks, two by two. Typically the calorimetry tests are done in that geometry. And then there are other tests that are a double row rack. That is, the one dimension being longer that the other.

Q. That partially answers my question. Let's split it in half.

A. Okay.

Q. For the suppression algorithms, - -

A. Yes.

Q. - - does it use double row racks or multi-row racks?

A. Those are tests, and I think those were Bert Hughes' tests that are a two by two array.

Page 1412, Line 10

Q. We talked about this a little bit earlier. Going back to the model. What is the proper, in your mind, or in your opinion, method for validating computer fire models? Let me restate it again. All right. Do you understand the question, sir?

A. I'm going to review it again, but I think I do. Obviously validation of a computer model is involved in both assurance that the code does what you think it does and that the model that's implemented compares - - involves comparison with data. You used the word "proper" and I'm not sure I can define for you what "proper" is. That is, I'm not sure I could give you a definition of "proper" versus "improper" validation. Not a word I would have picked, but, you know, you did.

Q. What word would you pick? Is there a correct method for validating a model, computer model?

A. There's not a well established protocol per se. There are some - there are some, you know, general ideas, which I think I have tried to indicate in my answer already; that is, comparison, the idea of the validation by comparison of data, you know, doing things - - doing checks on calcs to see that they do what you intend them to do. But I don't think there's a prescription that, you know, this is the proper method. There are certainly - - there's information around as to the process, but I don't know what I could identify this is a proper one and this is an improper one.

Page 1414, Line 15

Q. Okay. The model, the LES3D model encompasses or takes into account pre-wetting. Is that correct? Or does it?

A. The water does flow on to commodities and the water density does affect the burning rate. Those are the ways in which the model includes - - includes, you know, water application. It doesn't accumulate water on surfaces or anything of that sort.

Page 1425, Line 11

Q. Had Mr. McGrattan, et all disclosed what their margin of error or error rate is with respect to the LES3D program? At least as of the margin that you used?

A. I think the published papers, you know, that are cited in the report include comparisons with data that are illustrative of the margins of error and I think I we talked about some of those last time.

Q. Okay. And with respect to the inclusion of additional suppression algorithms that were proprietary or have been asserted to be proprietary to Hughes & Associates, have they been subjected to review for determination of how they affect rate of error?

A. As I indicated last time, the models that we used, the models aren't proprietary. It's the source code. And, of course, the models that were used are in the open literature and have comparisons available, data versus - -

Q. You said models. I was referring to algorithms. Were you using them - -

A. Algorithms are an implementation of a model.

Q. Okay.

A. And so I mean you have the question there of does the source code do what you want it to do, and that's error checking, which was done. And then there's the question of given the - - you know, a correct implementation of the model, how well does that model do relative to data. Those comparisons of model to available experimental data are included in the references we cited, which I believe are all exhibits to my deposition. I mean they exist.

Page 1426, Line 24

Q. In the model, the suppression algorithm decreases the rate of heat release over time?

A. The heat release rate is reduced by the application of water.

* * * * *

AAMA SMOKE VENT TASK GROUP
3100 S. Susan Street
Santa Ana, CA 97204
Phone: 800/609-9995
Fax: 714/545-0472

September 10, 1999

Re: American Architectural Manufacturers Association-
Smoke Vent Research Project

The AAMA Research Foundation and the AAMA Smoke Vent Task Group are pleased to announce the commencement of the AAMA Smoke Vent Task Group's research project. This project will study the interaction of smoke vents, draft curtains and sprinklers, and to develop scientifically based engineering design criteria for the installation of draft curtains and vents. An Action Plan summary is attached for your review.

Highlights of the 3-5 year study, focusing on life safety and property protection issues are:

- Design method and development of Validation Tests
    - Large eddy simulation (LES) Computer Model
    - Link actuated vent computer model with sprinklers (LA vent)
- Full-scale testing
- Finalization of results
    - Compare LES & LA Vents with test data
    - Finalize report and LA vents
- Validate LA Vent(s)
- Complete software development and users guide for LA Vents
- Smoke vent and draft curtain design criteria (from modeling and full-scale tests)

- Vent/sprinkler synergism performance study (from modeling and full-scale tests)
    - Alternative activation methodologies
    - Draft curtain design alternative
    - Make-up air design criteria
- Formalize engineering design criteria for installation of smoke vents and draft curtains

The project will be coordinated by Dr. Craig Beyler, of Hughes & Associates, Inc., and will utilize Hughes' team of researcher professionals. Others who will have committed to participate in the project are NIST and the University of Maryland Fire Protection Engineering Department.

I would encourage anyone interested in participating in the study to contact the AAMA Smoke Vent Task Group Chairman, Paul Simony, directly at (800) 609-9995, extension 268. Shortly we will be organizing a Technical Advisory Committee (TAC) to participate in developing the parameters for the full-scale tests. We are also searching for an appropriate building in the range of 50,000 sq. ft. or more to conduct the full-scale tests. Suggestions on a suitable location would be greatly appreciated.

If you would like additional information, please contact me at the above number.

Paul Simony
Chairman-AAMA Smoke Vent Task Group

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AAMA SMOKE VENT TASK GROUP
FIRE MODELING STUDY

AAMAnet.work newsletter-Summer 2006:

"*To concretely demonstrate the value of S&HV in terms of property protection, occupant safety, firefighter safety, and firefighter effectiveness, AAMA's Smoke Vent Task Group (SVTG) has inked a contract with Hughes and Associates to conduct Large Eddy Simulation (LES) and Computational Fluid Dynamics (CFD) studies in cooperation with the University of Maryland and the National Institute of Standards and Technology. Test results will provide data for an optimized S&HV design approach suitable for inclusion in Chapter 8 of NFPA 204, "Guide for Smoke and Heat Venting," or in model building codes.*"

AAMA Smoke Vent Task Group Conference Call Minutes-March 24, 2009:

"*There is a concern regarding the inability of C. Beyler* [Hughes Associates, Inc.] *to defend the Modeling Study, and specifically, the Fire Dynamics Simulator (FDS), after it was attacked by R.Schulte as a tool that has not been validated.*"

"*The concern remains that if C. Beyler is not willing to support the $100K SVTG Modeling Study, then the study is worthless. The members questioned why no other groups, organizations, or Fire Protections Engineers have come forward to defend the FDS program, particularly, Kevin McGratten* [McGrattan]*, from NIST, who wrote the original version of FDS, and has been intimately involved in it since its development. B.Sampson will contact K. McGratten* [McGrattan] *to obtain his thoughts on this.*"

* * * * *