

# SCHULTE & ASSOCIATES

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## IAN DAVID McAUSLIN, et al v. GRINNELL CORPORATION et al: THE BEYLER/CUSTER DEPOSITIONS IN A NUTSHELL

*"In a time of universal deceit, telling the truth is a revolutionary act."*

George Orwell

### **12.1.1 Roof Vents and Draft Curtains.**

*12.1.1.1 Manually operated roof vents or automatic roof vents with operating elements that have a higher temperature classification than the automatic sprinklers shall be permitted.*

**Substantiation:** *The intent of the [NFPA 13] standard is that roof vents and draft curtains should not be used in conjunction with storage protection. Previous language was unenforceable.*

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NFPA 13, 2010 edition**

The Pic 'N' Save Warehouse was designed by design-build contractors, Broadmoor Corporation, in 1988/1989. The warehouse portion of the building had dimensions of approximately 1,000 feet by 1,000 feet. The ceiling height of the center one-third of the warehouse was roughly 70 feet, while the ceiling height in other portions of the warehouse was roughly 40 feet.

The building, also known as McFrugal's Warehouse and the New Orleans Distribution Center (NODC), was designed for rack storage with a storage height of 65 feet in the high bay portion of the building. Portions of the building with lower ceiling heights were intended to be used to facilitate the flow of goods through the warehouse.

Initially, the storage capacity of the entire high bay section of the warehouse was not required so storage racks were only provided in the western portion of the high bay section. Prior to installing storage racks in the eastern portion of the high bay section of the warehouse, this portion of the warehouse was also intended to be used for staging of goods in the warehouse.

The double-row racks in high bay section of the warehouse were protected by ceiling sprinklers and in-rack sprinklers designed to protect a Class IV commodity (as defined by the rack storage standard, NFPA 231C). The ceiling sprinklers were high temperature large orifice sprinklers. The overhead system was designed to provide a density of 0.45 gpm/SF applied over 2,500 SF. Given that storage racks were not provided in the eastern portion of the high bay section of the warehouse, this portion of the warehouse was only protected by ceiling sprinklers located at the high bay roof. In other words, the sprinklers protecting the eastern portion of the high bay section of the warehouse were located 70 feet above the floor of the building.

In order to store goods that would not fit in the storage racks, the building owners installed portable racks in a multi-row rack configuration in the eastern portion of the high bay section of the building. Given that the height of the storage in the multi-row racks was 21 feet, in-rack sprinkler protection was required. The building owners contacted the sprinkler contractor who had designed and installed the sprinkler system for the building, Grinnell Corporation, to get a quote for the in-rack system installation, but elected not to provide the required in-rack sprinkler protection in the multi-row racks.

About 5:30 on the morning of March 21, 1996, a fire occurred in the multi-row racks located in the high bay section. Given that the only protection provided for the multi-row racks was the overhead system located roughly 50 feet above the top of the storage, the sprinkler system failed to control the fire. Despite the fact that the sprinkler protection was inadequate, the New Orleans Fire Department (NOFD) was able to bring the fire under control at about 10:30 and by noon the fire was extinguished.

In order to facilitate the clean-up operation at the building, the building operator requested permission from the NOFD to turn the electrical power for the building back on even though sprinkler system control valves throughout the building remained closed. At about 3 PM that same afternoon, a second fire occurred and since the sprinkler protection provided for the building was not in service, fire spread throughout the entire building.

After the fire, the only portions of the structure which remained were the concrete floor and concrete exterior walls of the warehouse and a two story office building separated from the warehouse by a 4 hour fire wall.

One of the insurers for the property was Lloyd's of London. Lloyd's retained legal counsel within days of the fire. Given the facts surrounding the fire, the plaintiffs attorneys had difficulty finding expert witnesses, however, eventually Dr. Craig Beyler and Richard Custer were retained as experts.

In Dr. Craig Beyler's expert report and depositions in this litigation, Beyler maintained that Grinnell Corporation and others were responsible for the loss due to the fact that the defendants never informed the building owner on the limitations of the protection for the east portion of the high bay section of the warehouse. Beyler further asserted that the protection provided for the eastern portion of the high bay section was inadequate for any type of storage due to the clearance between the sprinklers and the floor, that the installation of in-rack sprinkler protection in the multi-row racks as required by NFPA 231C would not have made any difference in the outcome of the fire and that the building should have been provided with draft curtains and roof vents, although these two features were not required by the building code.

## DR. CRAIG BEYLER'S EXPERT REPORT

“The value of smoke and heat vents with draft curtains in sprinklered buildings in cases where sprinkler[s] do not operate or are otherwise ineffective is widely acknowledged, and there is definite evidence that smoke and heat vents are value when sprinklers do perform as intended.”

“Had a properly designed smoke and heat vent system with draft curtains been designed for this building, the activation of sprinklers throughout the building could have been avoided, and the distribution of burning brands throughout the facility would have been controlled.”

“Smoke and heat vents with draft curtains should have been included in the NODC and should have been designed by a qualified Fire Protection Engineer. Their inclusion in the NODC would have prevented the activation of sprinklers throughout the facility and would have controlled the distribution of burning brands. As such, the damage resulting from the rekindle would have been eliminated.”

**Editor’s Note:** “*A qualified Fire Protection Engineer*” would have known that there were concerns that the automatic opening of smoke/heat vents could adversely affect the operation of the sprinkler system and the capability of the sprinkler system to control the fire. These concerns had been expressed since the 1970’s. These concerns have now been explicitly addressed in the roof vent provisions contained in the 2010 edition of NFPA 13. Hence, “*a qualified Fire Protection Engineer*” would not have recommended the installation of automatic smoke/heat vents and draft curtains in 1988 (or in 2010).

“In the east and west high bay areas, the [sprinkler] design as implemented did not protect against fires in those areas at all. The protection provided was simply based on extending the rack ceiling [sprinkler] protection and in anticipation of potential future expansion.”

“In the east and west high bay areas, the [sprinkler] design as implemented did not protect against fires in those areas at all.”

**Q.** . . . Other than FM, to your knowledge does anyone take a similar stance that FM takes with regard to heat vents and smoke removal systems?

**A.** . . . As I sit here, and obviously the review paper I prepared was for the purpose of reviewing this, it's probably better than my memory, but I can't think of anybody outside of FM who's published a research paper to that effect.

**Q.** What are the other factors that led to the magnitude of the loss?

**A.** . . . also my opinion that the absence of smoke vents and draft curtains was an important factor in the activation of sprinklers throughout the facility.

**Q.** With respect to the factors that led to the magnitude of the loss, I would like you to identify those.

**A.** Given the ignition, the fire grew in the fashion it did, was not controlled by the sprinkler system, which was inadequate to the hazard present, and caused fire not to be controlled by the sprinkler system, leading to excessive numbers of heads to be activated throughout the building, effectively leaving the building unprotected from a sprinkler [protection] point of view.

**Q.** Isn't it true that there is a significant disagreement within the fire protection community with respect to the efficacy of roof vents and draft curtains?

**A.** I think any disagreement that exists would best be cast around the term "cost effective" rather than whether they're effective.

“There’s evidence for cases where smoke and heat vents with draft curtains reduces the sprinkler demand. There are cases where it increases sprinkler demand. The one geometry that most notably has seemed to increase water demand sometimes is with the fire directly under the draft curtain. That had not been identified at the time of this design, but it is now - - has now been identified.”

**Q.** . . . As I appreciate your testimony, the presence of in-rack sprinklers in your view would have been irrelevant to the extent of the damage caused by the first fire. Correct?

**A.** . . .yes, I did opine that the [in-rack] sprinkler[s] would not have controlled the fire either.

**Q.** . . .I think you suggested, and correct me if I am wrong, that you didn't think that in-rack sprinklers would have been of any use in preventing or putting this fire out. Is that correct? . . .

**A.** Yes. And the - - let me try and complete the picture so that we're both clear. This was with regard to the three tier portable racks in the east end of the building as it existed at the time of the - -

**A.** Right. And if - - what I had said was normal in-rack sprinklers would include up to - - you know, within the tiers, not above the tiers, and that the fire would spread vertically to the top tier. That tier would burn and spread and would not be controlled by that system.

**Q.** So you're saying that flame would have spread past the in-rack sprinklers, igniting the level above before the in-rack sprinklers could have put it out?

**A.** In many instances. In most instances.

“The addition of in-racks, which is basically what we’re talking about, may have no effect on the damage or - - or may reduce the damage. If I didn’t say that, and from your reaction I may not have. That’s my intention. It makes no difference or may make it better. That is, less damage.”

“. . .The fire service would be faced with a different fire certainly, something that, you know, might be something on the order of half the size of the fire that they saw. . .So in terms of control, in terms of the area that would burn, you might do a little better, but I’m not envisioning you do a lot better. . .”

“Well, any - - any fire that in-rack sprinklers would control would not activate a ceiling sprinkler.”

**Q.** So you have no opinion as to what effect, if any, smoke and heat vents had on the amount of the loss that was suffered as a result of the fire?

**A.** Smoke and heat vents could have prevented the spread of heat to remote parts of the building by providing venting.

**Q.** I'm asking you whether you have an opinion as to whether you believe that an insurance company who underwrites the risk of the contents would have an understanding or should have an understanding as to the effect of draft curtains and roof vents and smoke vents as it relates to the extent of damage that might occur as a result of a fire in a particular facility.

**A.** I would say that by and large they don't understand that. Whether they should? I'd like them to, but I don't see that as anything other than what I'd like everyone to understand.

**Q.** Now, in your review and investigation, were you able to determine to what extent there were Group A plastics stored in these portable racks at the time of the fire?

**A.** No, I wasn't able to.

**Q.** From your standpoint it didn't make any difference whether there were Group A plastics or not as you conducted your investigation?

**A.** My understanding is that the outcome would have been the same without regard to which commodity classification was actually in place, yes.

**Q.** Do you have any opinion, Mr. Beyler, whether the storage of plastics in the facility at the time of the fire had any effect on the extent of the loss of the merchandise as a result of the first fire?

**A.** . . .my opinion based on my calculations involving Class II commodities that the outcome isn't sensitive to commodity classification in the area.

**Q.** To the extent that there were Group A plastics, would the result have been different?

**A.** It wouldn't have been.

**Q.** . . .Based upon your own research, the simulations that you did in conjunction with your recent report, do you agree or disagree with the statement that Mr. McGrattan - - et al, make, which states, for the record "The tests and model simulations showed that when draft curtains were installed, up to twice as many sprinklers activated compared to tests performed without curtains."

**A.** Well, the tests certainly didn't do that. So I'm going to have to look for that. But his modeling, I would have to look.

**Q.** Tell me what is misleading from your standpoint.

**A.** . . . However, we understand those tests to be not the most relevant one. That is, they aren't real commodities. You don't have real exting - - there is no extinguishment, there's no suppression. . . The more important test with regard to interaction of - - of the totality of the interaction of smoke, smoke and heat vents with draft curtains - - smoke and heat vents with

**Q.** You don't know whether it would have reduce sprinkler activation by one sprinkler, by ten, by a hundred, by two hundred, by a thousand, do you?

**A.** If by that you mean do I have quantitative estimate of the reduction, I don't.

**Q.** Would you agree with me, Mr. Beyler, that reasonable men, persons in the fire protection engineering community, could disagree on the inclusion or lack of inclusion of smoke and roof vents with draft curtains in connection with a building such as we have here at MacFrugal's/Pic-N-Save/ WCL? Would you agree with that?

**A.** Yes.

“And, in fact, you know, it is European practice to open the smoke and heat vents much earlier than we do in the U.S. Not uncommon in Europe to find them operated on smoke detectors, with the intention of being very early operation.”

**Q.** Well, let's ask the question then in reverse. Are there studies, research and tests which indicate that roof vents, in conjunction with draft curtains, in effect have the effect of delaying the activation of sprinklers?

**A.** I'm not aware of any.

“Because it's reducing the number, but never reducing the number in a way that the sprinklers that aren't activating are actually above a place where there's fire. That is, the operating areas may have been reduced, but the operation areas were always larger than the area that was burning. If in fact smoke and heat vents did reduce them enough that the sprinklers above the fire itself, which are the ones that can do any good, or course, were also prevented from operating that would be a negative effect. That's not what's observed.”

“Which - - Which, if that happened, would be reflected not in a reduction in the number of heads operating, but an increase in the number of heads operating. So that normally when you have delays you have increases, not delays that cause decreases. Small numbers of heads operating is a good thing. It’s a good thing.”

“No. The reduction in the number of heads operating is a good, favorable figure of merit. It is one of the ways that we judge a good sprinkler system. If you put it out with one head, that’s terrific.”

**Q.** And I take it from that, that it would be your opinion that whoever designed the Rancho Cucamonga facility did so improperly as it relates to the sprinkler system?

**A.** In the particular of excessive clearance, yes. . .

**Q.** Is it your opinion that by meeting the insurance and legal requirements that you will not get a design which will control fires which start in the facility? Let's leave it at that.

**A.** Satisfying the legal and insurance requirements may - - will not necessarily lead to a suppression system that can control fires. It might, but it might not also.

“I believe that it would be most consistent with [NFPA] 231C to use ten feet for these simply because they have used it for other - - together situation with more advanced technologies; at the same time, acknowledging that the FM data sheets would allow you to go to 20 [feet], for which I think there is - - there is basis. So if you had said more that 20 [feet], I would have agreed with you. With the ten foot number, there’s reason to - - to say there are other standards of care, other design documents that reflect a basis for something greater than ten feet.”

**Q.** You wouldn’t be able to tell me whether a fire that could start in the low bay area in single pallet high storage could be controlled by the sprinkler system that was installed?

**A.** I simply hadn’t looked at it.

**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.** 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.

**RICHARD CUSTER'S DEPOSITION TESTIMONY**

**Q.** And isn't a fact that, based upon your review of what existing at the time of the fire, that you believed that there was a change of use by the owner and that as result of that change in use there should have been additional protection, fire protection for that facility at the time the fire occurred? Do you agree with that?

**A.** Yes.

**Q.** Is it possible in your opinion that even with draft curtains and roof vents that we would have had sprinklers activating several hundred feet away from the fire?

**A.** Yes, I think that's - - I think that's possible.

**Q.** And as you understand what a variance is, it means that the building is in compliance with code. Is that correct?

**A.** Yes.

**Q.** And you have already mentioned that based upon your review of what existing at the time of the fire in the east end of the building that there should have been, to be in compliance with [NFPA] 231C, sprinklers in the racks. Right?

**A.** Yes.

**Q.** To the extent that my client, Broadmoor, delegated the design of the sprinkler system to somebody else, in this case Grinnell, wouldn't it be fair for my client to rely upon and presume that the sprinkler system was in fact capable of controlling a fire in this facility?

**A.** I think that - - that could be considered a fair assumption.

**Q.** And there is really no consensus in the design community as to whether the inclusion of draft curtains and roof vents is a good idea or a bad idea; is that correct?

**A.** My recollection is that there - - there were no - - at that time there were no guidelines for how to design these interacting systems.

**Q.** Okay. Now, you would agree with me that there is a difference of opinion in the design community as to the effectiveness or, for that matter, the possible detriment of installing draft curtains and roof vents? In connection with sprinkler design?

**A.** Yes.

**Q.** . . .Would you agree with me that NFPA has made the statement that a broadly accepted equivalent design basis for using both sprinklers and vents together for hazard control has not been universally recognized?

**A.** 204, for the design of vents, and is a statement by Gunter [Gunnar] Heskestad, yes, I have seen that.

**Q.** Do you think that that is in fact a true statement. In other words, do you agree with that statement?

**A.** I would say that I would agree that there is not a broadly based, agreed upon design or set of design requirements that could be applied across the board to deal that that - -

**A.** - - vent-sprinkler issue.

**Q.** Would you agree with me that there is some debate that has gone on even today as to whether the value received from the installation of smoke and heat vents and draft curtains justifies there cost?

**A.** That's - - That's been one of the points of debate.

**Q.** I take it from that that you don't believe that the inventory, the nature of the inventory was important in connection with your investigation?

**Q.** Have you discussed the commodities that were stored in the warehouse with any other expert hired by Lloyd's?

**A.** No.

**Q.** Have you discussed storage of commodities, even in a general sense, with Mr. Beyler?

**A.** I don't believe so. No.

**Q.** Are you aware, Mr. Custer, that certain changes were directed to be done at Rancho Cucamonga related to plastics storage after this fire?

**A.** I know that there were some recommendations. I don't recall what - - what they were as I sit here right now.

**Q.** Now, are you aware of whether aerosols were stored in the warehouse at the time of the fire?

**A.** I don't know whether they were or were not installed. I have seen references to aerosol, possibly hair spray I think somebody mentioned. I don't know what - - to the extent that they were there or not there.

**Q.** Are you familiar with and have you reviewed the variance requests that were made by Broadmoor to the State Fire Marshal - -

**A.** Yes.

**Q.** - - and the local building authorities? Yes?

**A.** Yes.

**Q.** And what particular code would be violated?

**A.** Well it would - - it would be operating outside the conditions of the variance, which in itself is not the code. Variances are these things not generally taken to be rewriting the code, but they are specific to a - - one application.

**Q.** I want to specifically refer to your report on page 4. . .“In the absence of a dropped ceiling, a properly engineered draft curtain and roof venting system would most likely have provided better access for the fire service.” You don’t know whether that’s true or not, do you, as it relates to this particular fire.

**A.** No, I don’t know for sure whether that’s true or not with respect - -

**Q.** To this particular fire?

**A.** That’s correct.

Although Dr. Craig Beyler and Richard Custer were both expert witnesses for the plaintiffs, there is clearly a difference of opinions on whether or not the installation of in-rack sprinklers in the multi-row racks would have had a significant impact on the severity of the fire in the warehouse and also on the issue of the use of smoke/ heat vents and draft curtains in buildings protected by a sprinkler system.

As has been noted many times before, the use of roof vents in buildings protected by a sprinkler system has been an issue which has been debated in the field of fire protection for well over 30 years. While Custer conceded that this was the case, Beyler continued to make the argument that the installation of automatic-opening roof vents in sprinklered buildings will not have a negative effect on the operation of the sprinkler system.

After more than 30 years of debate over roof vent issue, the NFPA 13 committee has finally put an end to the debate. The new roof vent provisions included in the 2010 edition of NFPA 13 specifically require that roof vent installations be designed to prevent the opening of vents in the early stages of a fire.

In effect, the NFPA 13 committee has completely rebutted Dr. Beyler's testimony regarding roof vents in the McAuslin, et al v. Grinnell Corporation, et al litigation. How is one considered to be an expert when your opinions and a good portion of your testimony are so completely destroyed? The fact that members of the NFPA 13 committee have opposed the use of roof vents in storage buildings protected by sprinklers has been common knowledge in the field since the 1970's.

What is also particularly interesting with respect to the testimony of both Beyler and Custer is the apparent lack of interest in the contents of the warehouse. Neither Beyler, nor Custer, seemed overly concerned over the fact that expanded Group A plastics, aerosol containers or flammable/combustible liquids may have been stored in the warehouse (in violation of the stipulations contained in the equivalency approvals). Of course, if these types of combustibles were stored in the warehouse, the fire which likely would have developed would in all probability have been markedly more severe than anticipated by these two “experts”. This fact would have changed the entire complexion of the fire and the plaintiffs’ experts analysis of the fire.

**Editor’s Note:** The author walked through the rubble within the exterior walls of the warehouse with a representative of Broadmoor Corporation within days of the fire. The rubble was littered with the remains of aerosol containers.

Previous articles have documented Dr. Craig Beyler's misuse of the fire modeling in his "expert" analysis of the fire at the McFrugal's Warehouse.

This article documents Dr. Beyler's testimony regarding the use of roof vents in buildings protected by sprinklers, the impact of the installation of in-rack sprinklers in the multi-row racks on the severity of the fire and Dr. Beyler's lack of interest in the fact that the warehouse contained Group A plastics and aerosol containers in violation of the conditions for which equivalencies were granted both by the City of New Orleans and the Louisiana State Fire Marshal's Office.

Dr. Beyler is a Fellow in the Society of Fire Protection Engineers (SFPE) and was awarded the SFPE's Guise Medal shortly after the testimony outlined above. Does Dr. Beyler's conduct as an "expert" in the McAuslin, et al v. Grinnell Corporation, et al litigation in 1999 conform to the ethical standards of the Society of Fire Protection Engineers or does his testimony simply embarrass the profession?

With the partial transcripts of Dr. Beyler's testimony in the litigation above, you can be the judge or jury and answer that question for yourself. It's my opinion that Craig Beyler is nothing more than a charlatan with a PhD and opinions for sale. It's time for the SFPE to consider asking Dr. Beyler to return the Guise Medal award, particularly considering the timing of the award with respect to his testimony in the McFrugal's Warehouse fire litigation.

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