Thursday, November 12, 2015
Testimony of FDNY Deputy Assistant Chief Thomas McKavanagh
NYC Council Hearing Intro. No. 56-A

Good morning Council Member Jumaane Williams, Council Member Crowley, and all the Council Members present. Thank you for the opportunity to speak today about Intro. No. 56-A regarding photoelectric detector technology. I am joined this morning by Assistant Commissioner Laura Kavanagh and Fire Protection Inspector Richard Roche. We appreciate the Council's concerns regarding fire safety and your efforts to increase awareness about the fire detection technologies available on the market.

Numerous studies, years of research, and real life data shows that many fatal fires occur at night when occupants are asleep. Nighttime fires are particularly dangerous because occupants are provided less time to become aware of and escape a fire. Some evidence shows that nighttime fires may be more likely to begin as slow smoldering fires. Photoelectric smoke detectors are the proven technology for these slow, smoldering fires. The other type of certified detector technology is ionization technology, and that technology is better at detecting fast flaming fires. Because both detectors provide different advantages and because it is impossible to determine what type of fire will occur in a residence, national organizations that test and certify detector standards, such as the NFPA, ICC, and UL, support the use of both types of detectors.

Of the two technologies, the majority of homes currently have ionization detectors rather than photoelectric. For this reason, the FDNY is currently providing photoelectric detectors as part of its "Get Alarmed NYC" education program announced just last week with the Mayor and the City Council. It is our hope that by providing photoelectric detectors as part of this program, we will increase the use of this technology.

While the FDNY shares the City Council's support for photoelectric technology, the FDNY believes there are a few issues to be discussed prior to enacting such legislation. As you are aware, the FDNY does not have a research and development arm to do independent testing of detectors. The organizations that do such testing currently support both photoelectric and

ionization smoke detector technologies and we do look to these experts before we make changes to the City's Fire and Building Codes. This legislation would limit the use of ionization detectors, which they have certified, given that many New York City dwellings only contain one detector. We would want to consult further with these organizations before limiting the use of an approved technology.

Additionally, the department worries that enacting such legislation might lead some people to remove an existing ionization detector if they believe such a detector is not effective or may incur a fine or penalty if used. Sadly, in two-thirds of fatal fires in New York City, a working detector of any type was not present. Therefore the overwhelming focus of the FDNY's fire prevention efforts is educating New Yorkers on the importance of having a certified, working detector in their home. We would want to ensure that the implementation of this legislation did not lead to the removal of any working detectors.

Finally, smoke detector technology continues to evolve and new technologies can emerge while old ones are still being implemented. For example, progress is being made around detectors that contain both photoelectric and ionization technologies, as well as around the prevention of nuisance alarms. FDNY would like to find a way to increase the use of photoelectric technology without closing the door to other technologies that may emerge.

Aside from the concerns mentioned above, the FDNY supports the City Council's efforts to bring photoelectric devices into people's homes. We look forward to working with them, and organizations such as the NFPA, ICC, and UL, to address the concerns mentioned above and find the best way to ensure New Yorkers are safe, and that fire deaths continue to decline.

We thank this Committee and the entire City Council for their ongoing support for our ongoing fire safety education and fire prevention efforts. My colleagues and I would be happy to take your questions at this time.

Uniformed Firefighters Association of Greater New York

IAFF Local 94
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Testimony in Support of Intro No. 56-A

The Uniformed Firefighters Association (UFA), which represents over 20,000 active and retired Firefighters, Fire Marshals, Pilots, Wipers and Marine Engineers, strongly supports Int. No. 56-A requiring installation of photoelectric smoke detectors in residential occupancies throughout New York City.

Photoelectric smoke detectors contain a light source and a light-sensitive electric cell. Smoke entering the detector deflects light onto the light-sensitive electric cell, triggering the alarm. These detectors are more sensitive to large particles given off during smoldering fires – the kind of fires that kill people when they are sleeping. In contrast, ionization smoke detectors have a small amount of americium-241, a radioactive material, and establish a small electric current between two metal plates, which, when disrupted by smoke entering the chamber, sounds the alarm.

In addition to delayed alarms, ionization smoke detectors are also more prone to false alarms and nuisance alarms from activities such as cooking. This leads residents to disable these alarms by removing the battery to silence the alarm. Unfortunately they often forget to replace the battery when they are finished cooking. Many lives have been lost because the batteries were never reinstalled. The use of photoelectric smoke detectors will save lives by not only alerting occupants quicker to a smoldering fire but also by not being disabled by residents due to nuisance alarms.

For all of these reasons the UFA strongly supports this legislation.

November 10, 2015

Ms. Jennifer Wilcox, Counsel to the Housing and Building Committee
Mr. Guillermo Patino, Housing and building Committee Political Analyst

RE: INT-56-A

Dear Ms. Wilcox and Mr. Patino and Esteemed Co-Sponcers

I am David Pace, Chairman of the Board of the California Real Estate Inspection Association (CREIA). CREIA strongly supports INT-56-A. An expanded view of our position has been contributed to Housing and Building Committee by Skip Walker. In January 2011, out of a conviction that Photoelectric Smoke Detectors/Alarms will save the lives of residents, firefighters and other first responders, CREIA adopted the following position:

> The California Real Estate Inspection Associations Official Position is to:
> Recommend ONLY Photoelectric Smoke Detectors/Alarms
>
> RESOLVED, That CREIA support the mandate of only photoelectric smoke detectors in California law and in all standard development organizations' building fire and life safety codes and standards.
>
> That CREIA support the installation of only photoelectric smoke detectors in all residential housing. And that CREIA does NOT recommend combination alarms.
>
> WHEREAS, dual alarms, also known as combination alarms, contain both technologies are available, the benefit over photoelectric in response to fires is marginal. They are more costly, and they will experience the same nuisance problems as ionization smoke alarms.

As you know, almost all U.S. homes have ionization technology smoke alarms. Decades of research clearly show that ionization alarms are ineffective in real world fatal fires. On the other hand, many scientific studies demonstrate that photoelectric technology smoke alarms in residential homes will save more lives. CREIA feels INT-56-A will reduce fatalities and other serious injuries and have national implications, serving as a model for other cities to follow.

CREIA was founded in 1976 and is one of the oldest and most respected home inspection organizations in the United States. CREIA is committed to working for changes in health and safety laws and building codes to require the use of photoelectric alarms around the country.

CREIA supports your efforts to require the use of photoelectric alarms. When adopted, this ordinance will significantly reduce the number of fire deaths in New York City. CREIA applauds the courage of you and the Co-Sponsors in championing this ordinance.

Respectfully,

David R. Pace, MCI
Master CREIA Inspector
CREIA Chairman of the Board, 2015-2016

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Testimony for the City Council re: Int. No. 56-A

November 12, 2015

Smoke Detectors – Saving People from Home Fires

Every day people die unnecessarily in home fires. There are two major reasons for this. The first is that they have no working smoke detectors. The second is that they have the wrong type of smoke detectors.

Most people do not know the differences between the two types of smoke detectors available: photoelectric and ionization. Without any guidance, people invariably select the cheaper ionization detectors which do not detect most deadly home fires.

It is important to understand that all fires and all smoke are not the same. The most deadly type of smoke in terms of number of casualties is created by slow smoldering fires that produce visible smoke, which can only be detected by photoelectric detectors. Typical sources of smoldering fires are cigarettes, overloaded electrical circuits, space heaters, hotplates, etc. The smoldering type of smoke they produce contains very few ions and therefore cannot be detected by ionization detectors.

The other type of smoke is created by flaming fires which produce large numbers of ionized particles. It is these ionized, positively charged atoms which react to disrupt the electron flow in ionization detectors. Absent these ionized particles, ionization detectors do not respond. They remain dormant as smoldering fires continue to grow until they finally produce enough heat to burst into flames. At that point ionization detectors will respond to fires, but at that point it is often too late for people to escape.

Having ionization detectors in homes with smoldering fires is equivalent to having no fire detection at all.

Here are the differences in the ways the detectors work. Photoelectric detectors have darkened chambers into which an infrared photobeam is pulsed every few seconds. When smoke enters the chamber it reflects this lightbeam to a photoreceptor which then initiates an alarm. Photoelectric detectors are completely agnostic to the electrical properties of smoke; they will detect any smoke that reflects light, whether it is produced by smoldering or flaming fires.

Photoelectric detectors will detect both types of fires: slow moldering fires, which are the most deadly, as well as rapidly flaming fires.

Ionization detectors work by an entirely different method. Inside ionization detectors is a small amount of a radioactive isotope, usually Americium, which ionizes the ambient air in the detection chamber. This causes free electrons which are negatively charged to create a small electric current between two plates of electrodes. When positively charged particles (positive ions) created in flaming fires enter the chamber, they bond with the free electrons disrupting the flow of electrons and causing an alarm. The problem is that smoke from typical smoldering fires contains too few ionized particles to disrupt the electron flow and cause an alarm.

Another problem with ionization detectors is that they false alarm so often when people are cooking that it gives them the mistaken impression their ionization detectors are providing adequate fire detection, even though they are incapable of detecting smoldering fires. The reason ionization detectors respond rapidly to the gases created by cooking is that the flames from the stove create a lot of ionized particles. If this were an actual fire scenario, the point at which a fire is flaming is often far too late to escape.

Ionization detectors will not detect slow smoldering fires, the most deadly kind; they will only detect rapidly flaming fires including cooking fires, which causes false alarms.

In a nutshell ionization detectors present two of the worst characteristics in residential fire detection in combination. First, they false alarm frequently due to cooking, so people often disable them or ignore them when there is a fire, and second, they fail to detect slow smoldering fires early enough to enable occupants to escape.

Why haven't the limitations of ionization detectors been clearly revealed to the public before, especially in light of many tests and many law suits which have repeatedly demonstrated their shortcomings? **Follow the money!** Certain manufacturers continue to push ionization detectors for residential use because they are less expensive to make than photoelectric detectors and produce higher profits. With mounting losses due to lawsuits in recent years, these manufacturers have changed the wording on their packaging to exonerate themselves from responsibility to reveal the entire truth about ionization detectors. Instead they now recommend people buy both types of detectors or combination units. These solutions, obviously, serve to increase the profits of the manufacturers without disclosing the limitations of ionization detectors and without actually providing real improvements in fire safety.

Ionization detectors should not be used as the primary smoke detectors in homes, period, because they cannot detect the type of smoke associated with the most common types of deadly residential fires. Ionization detectors are appropriate to use as a secondary means of residential fire detection.

Photoelectric smoke detectors are the only type of detectors available today at a mass market price point that provide adequate early warning fire detection of both slow smoldering fires and rapid flaming fires in residential occupancies.

As underscored by the continued marketing of ionization detectors, manufacturers will not voluntarily curtail their sales of ionization detectors in the spirit of the public interests over profits.

It is imperative, therefore, that municipalities pass legislation mandating the use of photoelectric detectors for primary residential fire protection.

But that is not the end of the story. Photoelectric smoke detectors also must be installed in all sleeping areas and along escape routes and supplemented with modifications as required to protect young children, the hard of hearing, the elderly and infirm, etc. The best fire detection can only be provided through a full fire alarm system that is constantly monitored and maintained by qualified personnel. But if the choice is to do the minimum to provide adequate fire protection because of budget constraints, then installing photoelectric smoke detectors in all residences is that minimum. There is no other current technology available that can provide this protection, and ionization detectors are not a suitable substitute.

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TESTIMONY

By

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Proposed Int. No. 56-A
A Local Law to amend the administrative code of the city of New York, in relation to requiring photoelectric smoke alarms in residential buildings

Submitted to the New York City Council
Committee on Housing and Buildings

November 8, 2015

- Joseph Fleming is currently serving as a Deputy Chief on the Boston Fire Department. He is also a member of UL217, Underwriters Laboratories Smoke Alarm Approval Standard.

I applaud the City of New York for recently taking steps, by mandating 10 years battery smoke alarms, to increase the probability that smoke alarms will be operational long after they are installed. However, I would like to point out that this proposal put forth by the New York City Council points the way to improve that legislation. (Note: I have been researching smoke alarm effectiveness for over 25 years. I have enormous respect for the FDNY and hope that is hope this information helps New York make a more informed decision.)

The evidence seems to indicate that even with ten-year batteries, most smoke alarms will still be disabled in just a few years. The number one reason that occupants disable smoke detectors is due to nuisance alarms. If a ten-year smoke alarm uses ionization technology, the evidence indicates that it is still likely to be disabled. If the battery cannot be removed then the smoke alarm will just be removed from the ceiling. The current technology that addresses the nuisance alarm problem in the most effective manner is photoelectric technology.

Ten-Year Alarms

What do the scientific studies show regarding the usefulness of ten-year batteries?

Several studies (References 1-3) have shown that even with ten-year batteries most smoke alarms will be non-operational just a few years after installation. Here is a quote from Reference #2.

> *However, the efficacy of OI seems to have dropped during the second 5 years of follow-up. There was a marked difference in incidence case rates between the first 5 years and the second 5 years in the programme population, with an apparent change in the cumulative incidence curve at about 6–7 years. This may have been due to non-functioning of smoke alarms over the years. Although lithium-powered alarms are supposed to function for 10 years, it was apparent from our follow-up testing that they do not. Although >90% of the programme houses had at least one working smoke alarm at the 2-year follow-up sample,* ***that proportion was down to 20% for the 10-year sample. This is similar to the findings of Jackson et al, (Reference #1) that only about one-third of lithium-powered smoke alarms were still functioning after 10 years.***

In these studies, the smoke alarms were ionization, which probably explains why so many were disabled. As a consequence, a huge improvement to this type of legislation, at little or no cost increase, would be to require that these alarms be photoelectric.

Here was a conclusion from a study in Iowa that used long life alarms. (Reference #3)

> *Photoelectric smoke alarms and lithium batteries are the most likely to function long after smoke alarm installation, and may be worthwhile investments despite their increased cost.*

What do the manufacturers recommend?

In the United Kingdom, Kidde, which also sells alarms in the US, provides photoelectric smoke alarms with ten-year batteries to fire brigades. (See Reference #4.) Here is a quote from that link –

> *Kidde's new product was designed with features that take into account feedback obtained from Fire Brigades in the UK & Eire, plus Social Housing Providers. Initial feedback from customers shown the new product has been very encouraging.* ***In line with current trends the alarm is available only in an Optical configuration.*** *(Note "optical" means photoelectric.)*

In the US, this same manufacturer, i.e. Kidde, explains why their new "worry-free" ten year alarm uses photoelectric technology. (See Reference #5)

> The "Worry Free Alarm uses *"**a photoelectric smoke sensor programmed to reduce nuisance alarms.** Certain municipal codes require that a smoke alarm installed near a kitchen use a photoelectric sensor to reduce nuisance alarms associated with cooking. Kidde's Worry Free line meets these requirements."*

Another US Manufacturer, First Alert, describes one of their ten year smoke alarms with the following language. (See Reference #6.)

> *"**Long Life Photoelectric Sensor Smoke Alarm** - This long life battery operated smoke alarm uses a lithium battery that is warranted to last 10 years. **The photoelectric smoke sensing technology reduces nuisance alarms from cooking smoke and shower steam.** Mute feature silences nuisance alarms from cooking smoke or shower steam. Single button also tests alarm functions. Easy access battery drawer: no need to remove alarm from ceiling to change battery. 10-year limited warranty. Meets UL standards.*

Do "sealed/tamper resistant" alarms solve the disablement problem?

Some have argued that as long as it is impossible to remove the battery, that the alarm will not be disabled. In my experience, the occupants will just remove the entire alarm. This experience is supported by NFPA data for manufactured homes. Having an alarm hard-wired to the ceiling is similar to having a "sealed/tamper proof" alarm. Yet in manufactured homes the majority of fires occur with disabled alarms. (I am assuming that these are hard-wired ionization alarms.)

> *Since 1976, every manufactured home sold should have included installed, hard-wired smoke alarms. ... Smoke alarms reportedly are missing in half (51%) of all manufactured home fires where smoke alarm status was reported. **Because all post-standard manufactured homes are required to be sold with smoke alarms installed, this implies a disturbingly high rate of smoke alarm removal by occupants.*** (See Reference #7.)

Nuisance Alarms

What does the International Association of Fire Chiefs (IAFC) say? (See Reference #8.)

> THE IAFC recommends *"installation instructions which state **that ionization alarms need to be spaced further away from fixed cooking appliances than photoelectric alarms to avoid nuisance activations".*** The IAFC also recommends that the Public should be educated about, ***"The reasons for locating ionization alarms away from cooking areas and bathrooms (steam from the shower)"***

In my opinion, relying on public education and "installation instructions" has been ineffective. If there is a clear benefit to using photoelectric alarms near kitchens and bathrooms, why not just legislate it?

What do public health researchers say?

In a paper published in 2000, Alaskan researchers concluded the following.

> *"In small rural residences, photoelectric smoke alarms have lower rates of false alarms and disconnection. **Photoelectric alarms may be the preferred choice for dwellings with limited living space or frequent false alarms."*** (See Reference #9.)

In 2007 researchers in Washington State concluded the following.

> *"Results suggest that the **selective use of photoelectric alarms by fire injury prevention programs or consumers may provide longer-term protection in similar populations.**"* (See Reference #10.)

What do manufacturers say?

An "Open Letter" to Legislators by BRK (First Alert) states the following.

> *Considering photoelectric smoke alarms are determined by industry experts to be significantly less prone to nuisance alarms and potential disabling of the batteries by consumers, **we support and encourage fire service administration and lawmakers that are moving toward the use of photoelectric smoke sensing technology.*** (See Reference #11.)

Response to Fires by Different Technologies

In the recent NIST (National Institute of Standards and Technology) Home Smoke Alarm tests the following results were obtained. (See Reference #12.)

NIST ANSWERS TO QUESTIONS REGARDING HOME SMOKE ALARM TESTS

Table 2. Average time to first alarm and time to untenable conditions, with standard deviations.

	Time to First Alarm (s)		Time to Untenable Conditions (s)	Available Safe Egress Time (s)	
	Photoelectric Alarms	Ionization Alarms		Photoelectric Alarms	Ionization Alarms
Smoldering Fires	2219 ± 1061	4010 ± 1120	4244 ± 1265	2064 ± 950	197 ± 336
Flaming Fires	97 ± 31	47 ± 35	216 ± 68	124 ± 64	175 ± 70
Cooking Fires	738 ± 103	688 ± 476	1464 ± 255	688 ± 476	777 ± 244

For the NIST test series, the average ASET (assuming placement of detectors in all rooms) for ionization alarms ranged between 175 s for flaming fires and 197 s for smoldering fires; for photoelectric alarms the ASET averaged between 125 s and 2064 s. For the purpose of the *Tech Beat* article, 180 s (or 3 minutes) was selected as representative of the amount of time available, and to convey to the reader the importance of leaving their residence quickly after first hearing a smoke alarm of any design.

This data was used to justify the following NIST Summary: *"According to the two-year NIST home smoke alarm performance study, ionization smoke alarms respond faster to flaming fires, while. The report concluded that, despite these differences, the placement of either alarm type on every level of the house provided the necessary escape time for the different types of fires examined."*(See Reference #13)

I would like to comment on this "Summary."

1. " ionization smoke alarms respond faster to flaming fires"
   - This is true but misleading. In the most common type of flaming fire, i.e. the cooking scenario, while the ionization is faster the photoelectric is still on average providing > 10 minutes escape time. In the very fast growing "flaming fires" the ionization is once again faster but the photoelectric is still providing, on average >2 minutes escape time. In many cases occupants are awake during these types of scenarios.

2. *"while photoelectric smoke alarms respond quicker to smoldering fires"*
   - This is true, but while, "quicker" = 30-50 seconds earlier, "quicker" now means 30 – 50 minutes. More importantly in many smoldering scenarios the ionization is providing

negative escape time, indicating that occupants would not be able to get out of the house safely, particularly since they are likely to be sleeping and relying on the smoke alarm to alert them.

3. *"The report concluded that, despite these differences, the placement of either alarm type on every level of the house provided the necessary escape time for the different types of fires examined."*
    - NIST could have just as easily concluded that **in the most likely scenario to occur while people are sleeping, i.e. the smoldering scenario, the ionization smoke alarm will often fail to provide necessary escape time.**

Here are quotes from others who have commented on this topic.

Source 1 - *"Application Specific Sensitivity: A Simple Engineering Model to Predict response of Installed Smoke Detectors,"* (Jensen G. et al., Interconsult Group ASA paper at Aube 1999).

"It is recognized that deadly fires and fires doing the most damage typically have a substantial undetected incipient stage while flame-ignited fires are typically intimate with awake people and connected to their activities. ***Hence, detection in order to alert is less important (in flaming fires).*** *Reference - Building Fire Statistics 88-97 Norway. Directorate for Fire and Explosion Prevention.*

Source 2 – Home Office, United Kingdom Fire Statistics 1983, London (1983).

"The data broke the fire into two types. Fires estimated to have been discovered within 5 minutes of ignition (most likely to have been rapidly growing flaming fires) and for fires where the time to discovery is estimated to have been 30 minutes or more (most likely to have involved a period of prolonged smoldering before severe flaming). The preliminary data show that there were 23,082 fires in the first category, but only 4 fatalities, while for the second category there were fewer fires (5,870) but 20 fatalities, a ratio per fire of 1:20. Obviously, a number of interpretations could be put on this data, but it does seem that people in this active age group are able to escape from rapidly growing fires in domestic-sized compartments. ***Fatalities are much more likely in fires that have undergone a period of prolonged smoldering, when victims may have been overcome by prolonged, low level exposure to narcotic fumes. If this is the case, perhaps there should be more concern about the ability of materials to continue smoldering, with toxic gas buildup over a long period of time, at least in the context of this class of fire."***

Source 3 - *"Detection of Smoke - Full Scale Tests with Flaming and Smouldering Fires, "Fire Safety Science,"* - Proceedings of the Third International Symposium, July, 1991,)

The advantage of ionization smoke detectors during flaming fires is only about a 15-20 second earlier warning. ***This margin will only be decisive for the loss of human life in extraordinary circumstances.*** *In general the difference between the alarm times for the optical and the ionization detectors are reduced when the detection is made from an adjacent room. This can be related to the fact that particles in the smoke tend to coagulate (smoke aging).*

Source 4 - "*A Decade of Detectors*", Fire Journal 09/85, John Hall (NFPA)

> *Delayed discovery, typically associated with fires that occur at night when everyone is asleep, also tends to be a characteristic of the smoldering fire caused by discarded smoking material.* ***These smoldering fires are the leading causes of US fire fatalities*** *and detectors are ideally designed to deal with them.*

Source 5 – Australasian Fire Authorities Council - Position on Smoke Alarms in Residential Accommodation (June 2006).

> *Current research indicates that:*
> - *ionisation smoke alarms detect flaming fires marginally earlier than photo-electric smoke alarms.*
> - *photo-electric smoke alarms detect smouldering fires and fires starting in areas remote from smoke alarms significantly earlier than ionisation smoke alarms.*
> - ***ionisation smoke alarms may not operate in time to alert occupants early enough to escape from smouldering fires.***
> - ***for both flaming fires and smouldering fires, photo-electric smoke alarms are likely to alert occupants in time to escape safely.***

Source 6 – International Association of Fire Fighters (IAFF) Convention Resolution (2008).

- *current research indicates that* ***ionization smoke alarms detect flaming fires marginally earlier than photoelectric smoke.***
- *photoelectric smoke alarms detect smoldering fires and fires starting in areas remote from smoke alarms* ***significantly earlier than ionization smoke alarms; and, ionization smoke alarms may not operate in time*** *to alert occupants early enough to escape from smoldering fires*
- ***many fires in residential occupancies begin as smoldering fires, particularly when occupants are sleeping,*** *photoelectric smoke alarms provide more effective all-around detection and alarm than ionization alarms;*

Source 7 – Mass. Building and Fire Code Joint Committee on Smoke Alarm Technologies (2007)

> *(4) Photoelectric type smoke detectors are, in general, as effective as or only slightly less effective than ionization type smoke detectors for detection of flaming fires in terms of time to detection and warning of comparable smoke conditions.*
> *(5) Photoelectric type smoke detectors are significantly more effective in providing earlier detection and warning than ionization type smoke detectors in smoldering fires.*
> *(6) Smoldering fires cause a significant percentage of deaths and injuries due to fires in the Commonwealth per year.*
> *(7)* ***Based upon the foregoing, the use of working Photoelectric smoke detectors should provide an earlier warning to occupants of a building involved in smoldering fires, therefore providing an enhanced level of safety and a potential reduction in fire deaths and injuries in the Commonwealth.***

Source 8 – *"Smoke Alarms and Batteries,"* Consumer, New Zealand. (Based upon the following research - *"The Response of Smoke Alarms to Two Smoke Sources – 2014,"* Fire Test report FM502, for Client Consumer New Zealand, BRANZ, New Zealand. https://www.consumer.org.nz/products/smoke-alarms-and-batteries/overview#which-type-of-smoke-alarm)

> *In 2006 and 2010 we tested how well photoelectric and ionisation alarms reacted to smoke from a flaming wood fire or a smouldering fire. The two alarms operate differently in detecting the presence*

of smoke (see above). ***We found that photoelectric smoke alarms gave you significantly more protection than the more common ionisation models – particularly for smoke from non-flaming smouldering fires.***

Our new test reinforces our earlier findings. This time we tested 9 photoelectric, 3 dual-sensor and 8 ionisation models – 20 in total. We tested them against a flaming wood fire and smouldering upholstery foam, both with steadily increasing smoke levels.

The dual-sensor models and all the photoelectric models gave the best protection from both types of fire. *The* ***ionisation*** *models were slightly better overall at detecting flaming fires –* ***but they were hopeless for smouldering fires.*** *None of them sounded at all during our smouldering fire test-runs. That failing is potentially fatal. Using dual-sensor alarms is the deluxe solution. But they're not that much of an advantage over our recommended photoelectric models.*

Massachusetts Experience

Starting in 2000, Boston started collecting information on smoke alarm type, i.e. ion or photo. Fortunately there are so few fatalities in Boston that there was little data upon which to form conclusions. Starting around 2010 the Massachusetts Department of Fire Services started to collect similar data. While there is no data yet on what percentage of homes in Massachusetts have photoelectric alarms the following leads one to the conclusion that it is a majority.

- Since 1997, all newly constructed or renovated homes would have to install photoelectric alarms to comply with building code
- In 2007 an industry insider stated that 70% of alarms sold in Mass are photoelectric.
- Most FD's in Mass have used photoelectric in the installation programs for many years.

If the majority of smoke alarms in Massachusetts are photoelectric then the data that has been collected so far is startling. In fires for which the smoke alarm data could be collected, the following results were obtained.

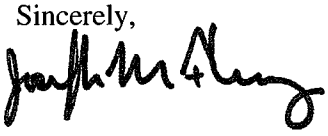
- 2011 - Ion (14 fatalities) photo (3 fatalities) **Ion involved in 82% of fatalities**
- 2012 - Ion (17 fatalities) photo (1 fatality) **Ion involved in 94% of fatalities**
- 2013 - 15 - Ion (53 fatalities) photo (6 fatalities) **Ion involved in 89% of fatalities**

Over a 4 ½ year period **very few deaths occurred with photoelectric smoke alarms.** In those fatal fires that did have photoelectric smoke alarms, there appeared to be factors, such as the victim being intimate, that rendered the smoke alarm irrelevant. **In addition, although many hard-wired ionization were disabled no photoelectric, even when powered by batteries, was disabled.**

Summary

New York City has done a tremendous job reducing fire deaths over the last few decades. The goal of reducing fire deaths in the future will be made easier, and reached faster, by increasing the use of photoelectric alarms.

Sincerely,



Joseph M. Fleming

References
(Links have been provided when possible.)

Bill No. 1111

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9. *"Ionization and photoelectric smoke alarms in rural Alaskan homes,"* West J Med, 2000;173:89-92
10. *"Randomized controlled trial of ionization and photoelectric smoke alarm functionality,"* Injury Prevention 2008;14:80–86.
11. "Photoelectric-Specific Legislation," http://www.brkelectronics.com/announcements/photoelectric-specific-legislation-letter
12. NIST Answers to Questions regarding Home Smoke Alarm Test (2007)
13. NIST Home Smoke Alarm Study (2004, and revised 2008).

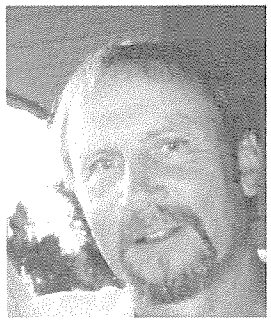
Other references are cited in the body of the document.

New York City
Building and Housing Committee

INT 56-A: Photoelectric Smoke Alarm Legislation Hearing

November 12, 2015

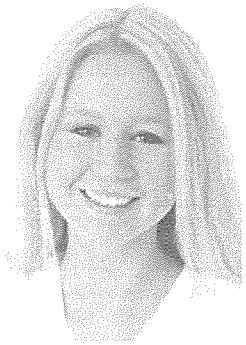
Proponent Submission: Dean Dennis, Fathers For Fire Safety



Dean Dennis

On October 24, 2013 I had the opportunity to present before you. I traveled from Cincinnati, Ohio at my own expense because I deeply knew the legislation Council Member Elizabeth Crowley was proposing would save lives.

I am very encouraged that you are revisiting this important legislation. Since my 2013 visit, I was very pleased that the FDNY contacted me (and others) and researched the importance of photoelectric smoke alarms.



Andrea Dennis

It took losing my daughter Andrea for me to understand how limited ionization alarms are as a safety device. I know too many people who have also lost their loved ones because of the limitations of ionization alarms. We are all grateful that this legislation is before you. Passing this legislation will save lives.

STATE OF NEW YORK

HACKERT vs. BRK

MARCH 2008

In 2001, Shelia Hackert lost her husband John Hackert, and her daughter, Christine Hackert, when *the BRK ionization smoke alarms in their home failed to sound a timely warning* in the early, smoldering stage of their fire. BRK was fined punitive damages (which is rare for a product liability suit in the State of New York). In the Summary Order the Federal Court judges stated:" the smoke detector's failure was a legal cause of the deaths of William and Christine Hackert."

More than a decade ago, a New York lawsuit involving ionization smoke detector failure marked a landmark $7,000,000 jury award. Since the case New York's neighboring states of Maine, Massachusetts and Vermont have changed their state statutes to require photoelectric technology ..... Dean Dennis

AUBURN, NEW YORK
MARCH 2012



On March 11, 2012 Averyana Dale (2) and her godmother, Rachel Harris-Curione (38), were killed in a house fire in Auburn, New York.

When Averyana's aunt, Valerie Rivett, visited the scene of the fire the following morning, she was stunned to find the lack of fire damage.

Despite brand new, hard-wired ionization smoke alarms, Averyana and Rachel had died from smoke inhalation. Unfortunately, fire deaths cases, like this one occur almost everyday.

Currently, the city of Auburn, New York is considering their ordinance to require photoelectric technology ..... Dean Dennis

What I Covered On October 24, 2013

- The lost of Andrea, the Ohio State University off-campus fire and how it impacted our family.

- An explanation of how the two smoke alarm technologies work.

- Why the statement that ionization alarms are faster in flaming fires, and photoelectric alarms are faster in smoldering fires; (1) Doesn't highlight the performance problems with ionization alarms. (2) Deflects that fires have stages. (3) Deflects that ionization alarms, by design, will likely miss early warning opportunities.

- Presented testing data from National Institute of Standards and Technology (NIST) showing that photoelectric alarms sounded up to 54 minutes sooner than ionization alarms in some smoldering stage fires and ionization alarms can fail to provide ample escape time. Presented information that NIST has documented in their testing that ionization alarms have completely fail to sound even when a room is filled with smoke from a smoldering stage fire.

- Presented testing data from Texas A&M that ionization smoke alarms have greater than a 50% failure rate regarding escape time in smoldering stage fires compared to 4% for photoelectric alarms.

- Presented statistical information from the NFPA and the CPSC that ionization smoke alarms have a significantly higher nuisance alarming problem compared to photoelectric alarms, therefore causing them to get disproportionately disabled at a significantly higher rate.

- Presented that Boston requires photoelectric technology whereas Baltimore does not, and although Boston is a larger city, over the same four year period Boston had only 4 fire deaths compared to Baltimore's 75.

What is New Since the October 24, 2013 Presentation

- Cincinnati, Ohio became the first major city not covered by a state statute to require photoelectric alarms in all rental properties.

- Ohio Senator William Seitz is introducing a state statute that will require only photoelectric smoke alarms in all residential and rental properties.

- The Ohio Fire Chiefs Association has taken a formal written position of only endorsing photoelectric smoke alarms.

- Underwriter Laboratories has recently passed stricter testing standards for smoke alarms which go into effective September 2017. The new standards will require a new rigid nuisance alarming test, more rigid smoke obscuration standards for smoldering tests, more rigid flaming standards and a new polyurethane test. The new standards will make it highly unlikely that ionization alarms will be able to pass the standards after 9/17.

- Honeywell, Simplex Grinnell, Siemens and Tyco no longer manufacturer ionization smoke alarms for residential use. The newer alarms by Kidde, First Alert, BRK and Nest are all photoelectric alarms.

- Australia is currently holding a Senate Inquiry on smoke alarms after Senator Lazarus has called for a ban on ionization alarms.

New York is often regarded as the greatest city in the World. New York has an opportunity to do something great for the people of New York, while leading the rest of the United States and World. Passing stricter fire safety standards will save lives and the scars from fires.

Thank you,
Dean Dennis

New York City Building and Housing Committee
Photoelectric Smoke Alarms



Presented By:

Skip Walker
MCI, ACI



Smoke Alarm Legislation Committee Hearing Int. 56-A
November 12, 2015

New York City Building and Housing Committee
Photoelectric Smoke Alarms

American Society of Home Inspectors

California Real Estate Inspection Association

Both Have Strong Position Statements Endorsing Photoelectric Smoke Alarms

(Modeled After IAFF Position)

Skip Walker, MCI, ACI

New York City Building and Housing Committee

Photoelectric Smoke Alarms

It Is ASHI and CREIA's Belief That Strong National Photoelectric Alarm Legislation Can Reduce The US Fire Death Rate By 40% Or More

Skip Walker, MCI, ACI

New York City Building and Housing Committee

Photoelectric Smoke Alarms

*What New York City Does On This Issue Not Only Impacts NYC Residents..... It Has **Broad** National Implications*

Skip Walker, MCI, ACI

New York City Building and Housing Committee

Photoelectric Smoke Alarms

INT 56-A Will Save Lives

ASHI & CREIA Strongly Support INT 56-A

Skip Walker, MCI, ACI

New York City Building and Housing Committee

Photoelectric Smoke Alarms

For All Of Our Technology, We Can Do A Much Better Job Protecting Our Citizens From Fires

Skip Walker, MCI, ACI

New York City Building and Housing Committee
Photoelectric Smoke Alarms

- From a fire safety perspective, the US is a Third World Country
- The NYC Fire Department responds to more calls per year than ALL fire departments in Japan
- US Fire Death Rate per Million Population = 12.3*
- Swiss Fire Death Rate per Million Population = 2.0*
- Singapore Fire Death Rate per Million Population = 2.3*

* *Source: FEMA International Death Rate Trends 1979-2007*

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Number of Households in The Us with Smoke Alarms:

1960: Almost Zero
1977: 18 Million/22%
2007: 111 Million/96%

Source: NFPA, Smoke Alarms in US Fires 2011

New York City Building and Housing Committee

Photoelectric Smoke Alarms

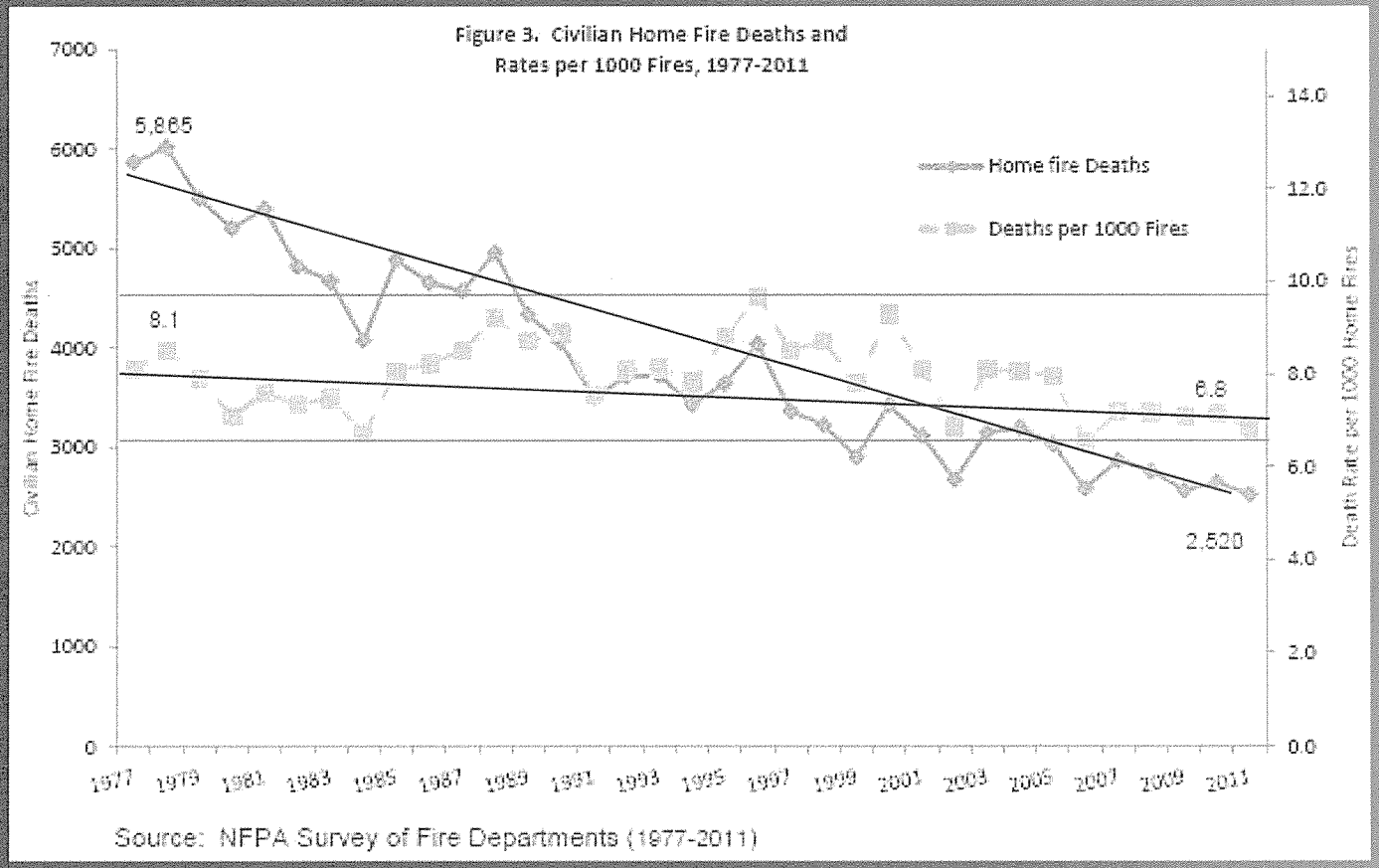
Number of Households in The Us with Ionization Smoke Alarms:

Approximately 90%-95%
100-105 Million Homes

Source: Industry Sales Figures/Research Report Estimates

Deadly Differences
Ionization vs Photoelectric Smoke Alarms

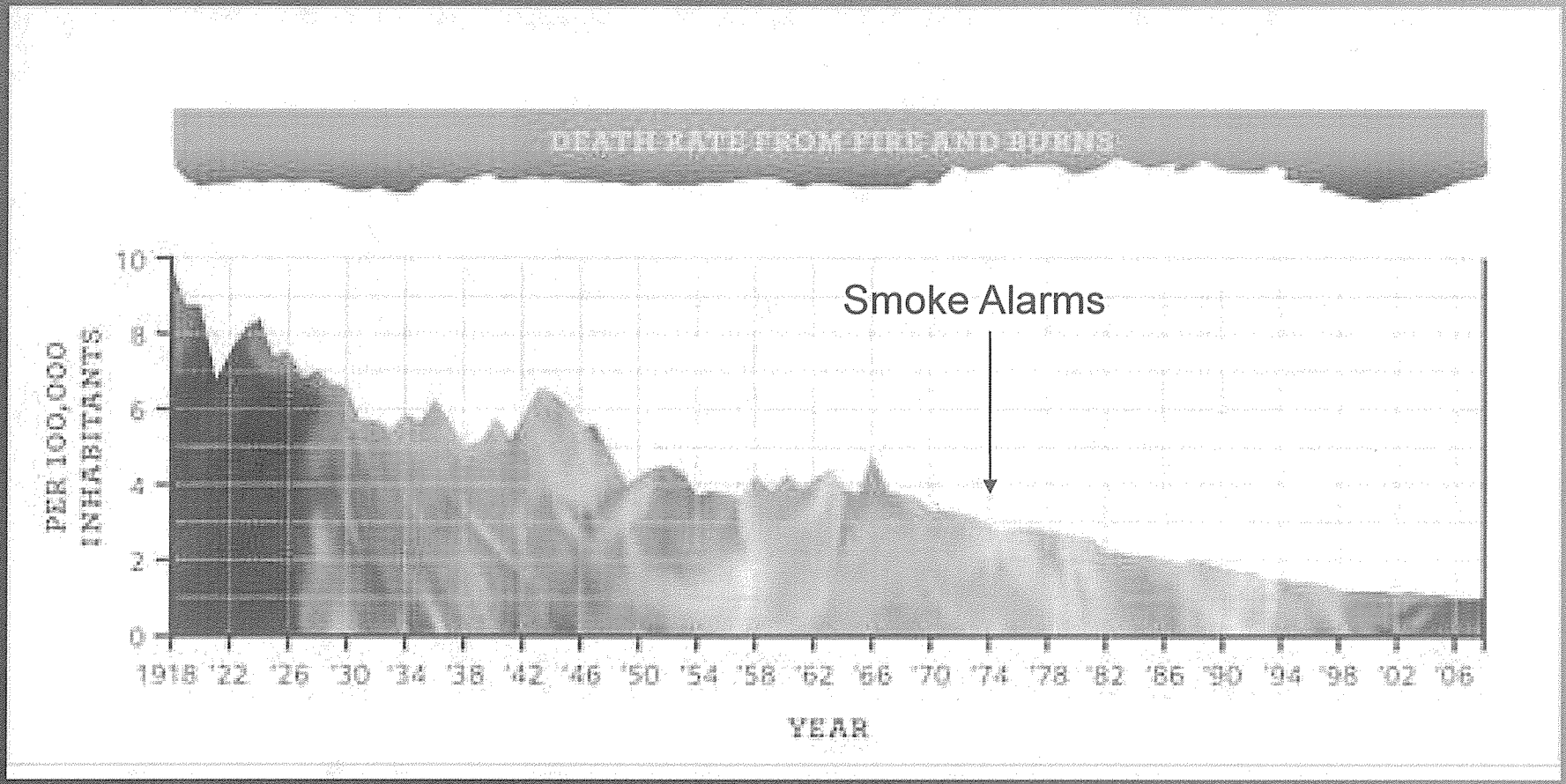
US Home Fire Deaths and Rate Per 1,000



Source: NFPA Fire Loss 2011

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Fire Deaths 1918-2006



New York City Building and Housing Committee
Photoelectric Smoke Alarms

Between 1977 and 2011 Hundreds of Millions of Residential Smoke Alarms Were Installed in US Homes

"Even though the number of home fires and home fire deaths declined similarly during the period, the death rate did not"

Source: NFPA Fire Loss 2011

New York City Building and Housing Committee

Photoelectric Smoke Alarms

After Installing Hundreds Of Millions Of Ionization Smoke Alarms In U.S Homes, The Publics Risk Of Dying In A Fire Remains Essentially Unchanged

Clearly Something Is Not Right....

Skip Walker, MCI, ACI

New York City Building and Housing Committee

Photoelectric Smoke Alarms

All Fires Do Not Carry The Same Risk Of Death

Skip Walker, MCI, ACI

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Cooking/Fast Flame Fires Account for:

42% of Fires, **37%** of Injuries

Only of **15% of Deaths**
Directly Attributed to Flames

Smoldering Fires Account for:

23% of Fires, 29% of Injuries and **61% of Deaths**

Source: NFPA Data

New York City Building and Housing Committee

Photoelectric Smoke Alarms

Time of Day Matters

- 37% of Fires Occur Between 8 PM & 8 AM
- 66% of Fire Deaths Occur Between 8 PM & 8 AM

Source: NFPA Home Structure Fires 2011

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Roughly ***Two-Thirds*** of Fire Deaths Occur In Homes With ***No*** Functional Smoke Alarm

- Yet **96%** of US Homes Have at Least One Alarm
- Roughly **50%** of Homes With Intentionally Disabled Alarms Cite Nuisance Trips As The Reason
- *Studies Show That Ionization Alarms Account for Almost All Nuisance Alarms*

New York City Building and Housing Committee
Photoelectric Smoke Alarms

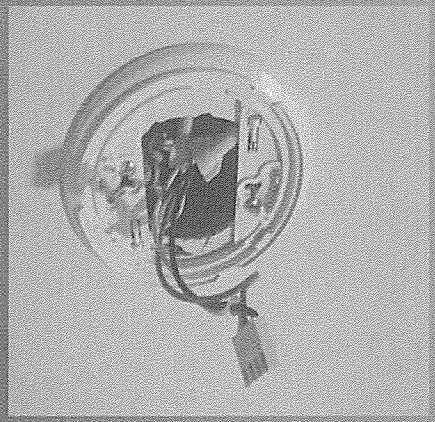
In Other 50% Of Homes With No Functional Smoke Alarm

- Dead/Missing Batteries
- Other Power Source Issues
- Electronic Failure; Roughly 3% Per Year Compounded

New York City Building and Housing Committee
Photoelectric Smoke Alarms

If Dead Batteries Are Such A Problem, What About 10 Year Batteries and Anti-Tamper Alarms?

- Without Eliminating Nuisance Tripping Issues, Alarms Will Simply Get Removed As Hardwired Alarms Do Now



New York City Building and Housing Committee
Photoelectric Smoke Alarms

Center for Disease Control (CDC) SAIFE Program 10 Year Study on Lithium-Ion 10 Year Batteries

"Eight to ten years after the installation of the lithium powered smoke alarms, the inspectors found that one-third of the alarms were still functional"

37% of the installed alarms were missing
30% of the alarms were present but not functioning
Of the 180 present but not functional, 43% had a dead battery; 17% had no battery; 13% appeared nonfunctional because of physical damage, remaining
27% were non-functional for other reasons; missing parts, dust accumulation, etc.
38% of the dwellings had at least one of the originally installed alarms functional
30% of the dwellings had all of the originally installed alarms still functional.
In 34% of the dwellings, all of the originally installed alarms in the home were missing.

Source: Evaluation of Fire-Safety Programs That Use 10 Year Smoke Alarms, J Community Health (2010) 35:543–548

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Dallas Alarm Evaluation: Operation Installation

*"Although lithium-powered alarms are supposed to function for 10 years, it was apparent from our follow-up testing that they do not. Although >90% of the programme houses had at least one working smoke alarm at the 2-year follow-up sample, **that proportion was down to 20% for the 10-year sample**."*

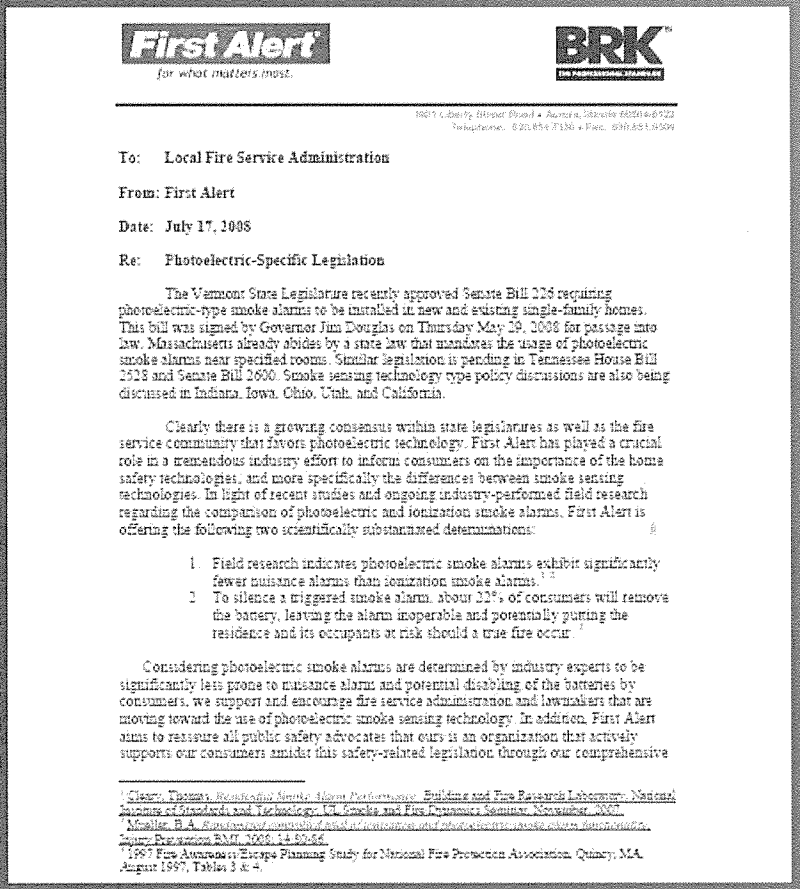
This community-based smoke alarm installation programme was highly effective for residents of houses that received a smoke alarm, for the first 5–6 years after installation, but its efficacy declined substantially after that time.

- Most cases of house fire-related deaths and injuries in programme houses occurred in houses where the programme smoke alarm either did not work, or had been removed.
- Based on this data, smoke alarm installation programmes may not be able to plan on efficacy remaining high for the full 10 years that lithium powered alarms are advertised to work.

Source: Preventing deaths and injuries from house fires: an outcome evaluation of a community-based smoke alarm installation programme, Injury Prevention, July 2013

New York City Building and Housing Committee
Photoelectric Smoke Alarms

BRK/First Alert Letter to Vermont Fire Dept's



First Alert
for what matters most.

BRK

3901 Liberty Street Road • Aurora, Illinois 60504-8122
Telephone: 630.851.7330 • Fax: 630.851.1650

To: Local Fire Service Administration

From: First Alert

Date: July 17, 2008

Re: Photoelectric-Specific Legislation

The Vermont State Legislature recently approved Senate Bill 226 requiring photoelectric-type smoke alarms to be installed in new and existing single-family homes. This bill was signed by Governor Jim Douglas on Thursday May 29, 2008 for passage into law. Massachusetts already abides by a state law that mandates the usage of photoelectric smoke alarms near specified rooms. Similar legislation is pending in Tennessee House Bill 2528 and Senate Bill 2600. Smoke sensing technology type policy discussions are also being discussed in Indiana, Iowa, Ohio, Utah, and California.

Clearly there is a growing consensus within state legislatures as well as the fire service community that favors photoelectric technology. First Alert has played a crucial role in a tremendous industry effort to inform consumers on the importance of the home safety technologies, and more specifically the differences between smoke sensing technologies. In light of recent studies and ongoing industry-performed field research regarding the comparison of photoelectric and ionization smoke alarms, First Alert is offering the following two scientifically substantiated determinations:

1. Field research indicates photoelectric smoke alarms exhibit significantly fewer nuisance alarms than ionization smoke alarms.[1] [2]
2. To silence a triggered smoke alarm, about 22% of consumers will remove the battery, leaving the alarm inoperable and potentially putting the residence and its occupants at risk should a true fire occur.[3]

Considering photoelectric smoke alarms are determined by industry experts to be significantly less prone to nuisance alarm and potential disabling of the batteries by consumers, we support and encourage fire service administration and lawmakers that are moving toward the use of photoelectric smoke sensing technology. In addition, First Alert aims to reassure all public safety advocates that ours is an organization that actively supports our consumers amidst this safety-related legislation through our comprehensive

[1] Cleary, Thomas, *Residential Smoke Alarm Performance*. Building and Fire Research Laboratory, National Institute of Standards and Technology, UL Smoke and Fire Dynamics Seminar, November, 2002.
[2] Mueller, B.A. *Simultaneous operation of ionization and photoelectric smoke alarms, functionality, injury*. Burn Incidence BMC 2008, 14:60-66.
[3] 1997 Fire Awareness Lifestyle Planning Study for National Fire Protection Association, Quincy, MA. August 1997, Tables 3 & 4.

New York City Building and Housing Committee
Photoelectric Smoke Alarms

BRK/First Alert Letter to Vermont Fire Dept's

In light of recent studies and ongoing industry performed field research regarding the comparison of photoelectric and ionization alarms, First Alert is offering the following two scientifically substantiated determinations:

- *Field research indicates photoelectric **smoke alarms exhibit significantly fewer nuisance alarms that ionization alarms**.* [1] [2]
- ***To silence a triggered alarms, about 22% of consumers will remove the battery, leaving the alarm inoperable** and potenitally putting the residence and its occupants at risk should a true fire occur.* [3]

"...we support and encourage fire service administration and lawmakers that are moving toward the use of photoelectric smoke sensing technology".

New York City Building and Housing Committee
Photoelectric Smoke Alarms

The Key To Reducing Deaths In The Two-Thirds With "*No Functional Alarm*"

Is To Reduce Nuisance Trips

and Keep Power To The Alarm

Skip Walker, MCI, ACI

New York City Building and Housing Committee

Photoelectric Smoke Alarms

Smoke Alarms/Detectors in Residential Construction

In Residential Settings, The Two Smoke Alarm Sensor Technology Types Most Commonly Found Are:

Ionization

Photoelectric

Skip Walker, MCI, ACI

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Ionization Alarms:

- About 90-95% of Alarm Installs in US
- Very Prone to Nuisance Trips; Showers, Cooking, Etc
- Very Slow at Detecting Smoldering/Fatal Fires
  - Average 30 Minutes Slower, Range 15-90 Minutes
- Can Fail Outright to Alarm in 1 of 5 Smoldering Fires
- Slightly Faster for Flaming Fires
  - Average 50 Seconds

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Ionization Alarms:

- About 90-95% of Alarm Installs in US
- Very Prone to Nuisance Trips; Showers, Cooking, Etc
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- Can Fail Outright to Alarm in 1 of 5 Smoldering Fires
- Slightly Faster for Flaming Fires
  - Average 50 Seconds

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Photoelectric Alarms:

- 5% or Less of Alarm Installs in US
- Virtually No Nuisance Trips; Studies Show As Little as 3%
- Significantly Faster at Detecting Smoldering/Fatal Fires
  - Average 30 Minutes Faster, Range 15-90 Minutes
- Slightly Slower in Flaming Fires
  - Average 50 Seconds

New York City Building and Housing Committee
Photoelectric Smoke Alarms

UL 217 Ponderosa pine	12126	3244	63.9	71.1	3226	63.9	72.0
	12132	DNT	--	--	3318	73.4	76.4
	12143	3826	66.0	74.3	3805	68.2	75.0
	12184	3547	66.0	70.1	3451	71.6	75.9
	12185	2894	64.6	73.6	2722	72.3	79.1
Bread – 4 slices	12133	319	66.1	98.0	364	45.9	55.5
	12155	306	71.5	99.4	371	41.5	45.8
	01244	343	75.8	98.5	448	28.4	19.4

Ion's Did Not Respond In 1 Out Of 5 UL 217 Tests – A *20% Failure Rate*

<u>This Is The Test and Material They Are Required to Pass to Be Sold</u>

Ion's Responded Average of 22% Faster to Burnt Toast

UL Smoke Characterization Study, 2007, Page 109, Table 25

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Mattress PU foam – 100 × 125 × 100 mm foam with a 25 × 150 × 150 mm piece on two opposing sides	12202	DNT	--	--	3149	85.3	77.2
	12261	5610	63.2	58.5	3032	81.4	68.8
Mattress PU foam wrapped in CA TB 117 cotton sheet – 100 × 150 × 200 mm foam	01232	DNT	--	--	3530	83.2	77.5
Mattress PU foam wrapped in CA TB 117 cotton sheet – 125 × 125 × 300 mm foam	01241	DNT	--	--	4207	88.5	80.5
Mattress PU foam wrapped in polyester microfiber sheet – 125 × 125 × 300 mm foam	01233	DNT	--	--	5353	83.5	79.8
	01245	DNT	--	--	4128	90.2	73.6
Nylon carpet – 150 × 150 mm sample	12262	DNT	--	--	5727	84.4	84.3
Polystyrene pellets – 69.8 g	12272	DNT	--	--	5546	82.6	74.5

DNT = Did NOT Trigger **Ion's Did Not Trigger in 7 of 8 Tests**

Test 12261: Time = 5610 at 10.57% Obs / Tripped 43 Mins After Photo

UL Smoke Characterization Study, 2007, Page 109, Table 25

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Texas A&M 1997 Three Year Study

- Used Same Fault Analysis Model Developed To Predict Performance of Naval Weapon Systems
- Analyzed Previous Data From NIST, CPSC, Etc.
- Ran Many Smoldering/Flaming Tests In Real World Situations
- Ran All Data Through Fault Model

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Study Concludes That:

The Probability Of A Fatality In A Flaming Fire Is:

Ionization Alarms: **20%**

Photoelectric: **4%**

Even Though Ion's Have Theoretical Advantage, It Is Negated By Intentional Disconnects From Nuisance Trips

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Study Concludes That:

The Probability Of A Fatality In A Smoldering Fire Is:

Ionization Alarms: **55%**

Photoelectric: **4%**

Ion's Respond Slower AND Have A High Level Of Intentional Disconnects From Nuisance Trips

New York City Building and Housing Committee
Photoelectric Smoke Alarms

After Decades, CPSC Finally Weighs In:

Letter to Underwriter's Laboratory (UL) STP 217 Nov. 18, 2014 Regarding Proposed Smoke Alarm Standard Change:

*…..today's typical single sensor smoke alarms, which have a **45 to 49*** percent average occupant successful escape rate for selected fires, more so for the smoldering fires than flaming fires.*

**Source: NIST Technical Note 1837, July 2014*

New York City Building and Housing Committee
Photoelectric Smoke Alarms

UL STP 217:

- ***STP 217 = Standards Technical Panel 217***
- ***Responsible For Writing Smoke Alarm Testing Standard***
- ***43 Members***
- ***Many Are Manufacturers and Industry Consultants That Work For Manufacturers***
- ***Takes 2/3's Vote to Change Standard***
- ***Manufacturers Have Over 1/3 of Votes***

New York City Building and Housing Committee
Photoelectric Smoke Alarms

UL STP 217:

- ***STP 217 Passed Revised 217 Standard Sep. 2015***
- ***Adds Polyurethane Smoldering Test***
- ***Adds Cooking Nuisance Trip Test***
- ***Does Not Take Effect For Two Years***
- ***It Took About 25 Years To Make The Change***

Still A Great Step, But.....

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Revised UL 217:

- ***Projected Performance Increase From 45-49% to 80%***
- ***New Standard Represents A 1 in 5 Failure Rate In A Life-Safety Device – Still Unacceptably High***
- ***Does Not Address The 105 Million Homes With Existing Ionization Alarms***

Photoelectric Alarms Give 96% Successful Occupant Egress And Do It Today

Skip Walker, MCI, ACI

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Why Not Use Combination P/I Alarms?

The **alarm logic is an {OR}-type** such that the alarm is activated if either the photoelectric sensor or ionization sensor alarm threshold is met. The **individual sensor sensitivities are not tested separately.** Therefore, manufacturers have the freedom to set each sensor's sensitivity separately. ***Since an individual sensor can be set to meet all current sensitivity standards, it is not obvious what overall benefit is achieved from a dual alarm*** with an additional sensor technology that could be more or less sensitive than what would be found in a standalone unit employing such a sensor.

New York City Building and Housing Committee
Photoelectric Smoke Alarms

The Laws Of Physics Can't Be Broken

- ***Ionization Alarms Detect Fast Moving That Are Less Than One Micron in Size***
- ***Photoelectric Alarms Detect Particles One Micron And Larger In Size***
- ***Smoldering Fires Create Slow Moving Particles That Are Over One Micron In Size***
- ***Ion Alarms Are Literally Blind To Them!***
- ***Photo Alarms Are Not.***

New York City Building and Housing Committee
Photoelectric Smoke Alarms

The Key To Reducing Deaths In The One-Third With "*Functional Alarms*"

Is To Have Alarms That Stay Connected and Respond Faster in Real World Fatal-Fire Scenarios, i.e., Smoldering Fires

Only Photoelectric Alarms Can Do This.....

And They Can Do It Today!

Skip Walker, MCI, ACI

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Photoelectric Technology Laws In Place In:

Massachusetts

Ohio

Vermont

Maine

Rhode Island

Iowa

Skip Walker, MCI, ACI

New York City Building and Housing Committee
Photoelectric Smoke Alarms

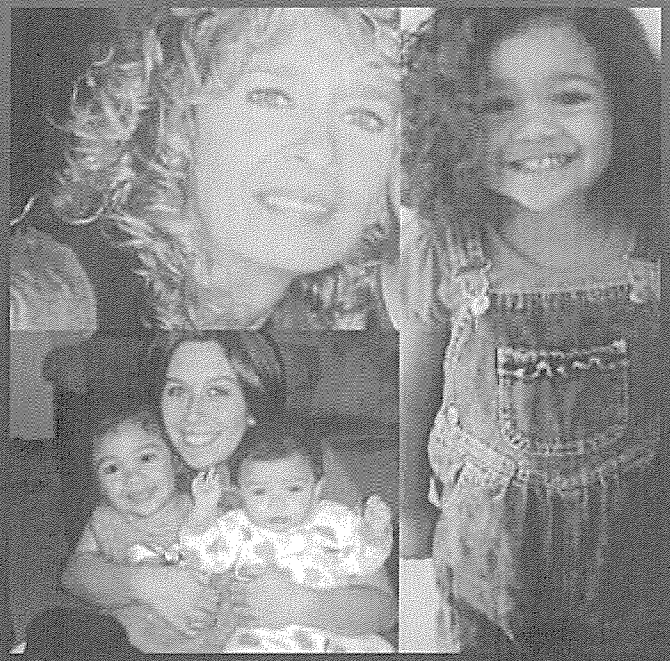
In Ohio, Photoelectric Technology Ordinances Are In Place In 8 Cities, including Cincinnati

Ohio Legislation Requiring Photoelectric Only Technology Appears Eminent

In California, Photoelectric Technology Ordinances Are In Place In 4 Cities

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Pending Averyana's Law, New York



Aunt Valerie Rivett, Averyana Dale, Natalie her Godmother and sister Gia

"Ionization detectors are present in about 95% of homes. Unfortunately these types of detectors have a high rate of failure when detecting smoldering fires. **Photoelectric detectors on the other hand, are extremely successful** at detecting smoldering fires.

Averyana Dale most likely lost her life because the ionization smoke detector that was present in the home she was in did not alert her to the fire until it was too late. If a photoelectric detector had been in the home, it is considerably more likely she would have been alerted to the smoke sooner and would have made it out safely".

Legislation will provide tax incentives for purchase of photoelectric alarms.

New York City Building and Housing Committee
Photoelectric Smoke Alarms

International Association of Fire Fighters:

Official Position Calling for Photoelectric Only Technology
Specifically States, No Combination Detectors

IAFF Represents Around 300,000+
Fire Fighters in US & Canada

Skip Walker, MCI, ACI

New York City Building and Housing Committee
Photoelectric Smoke Alarms

Both California Real Estate Inspection Association
And
American Society of Home Inspectors

Official Position Supporting Photoelectric Only Technology
Specifically States, No Combination Detectors

Both Mirror IAFF Position

New York City Building and Housing Committee
Photoelectric Smoke Alarms

In closing.....

- *All Fires Do Not Carry The Same Risk Of Death*
- *Two-Thirds of Fire Deaths Occur in Homes With No Functional Alarms*
- *Half of Non-Functional Alarms Are Attributed to Nuisance Trips*
- *Almost All Nuisance Trips are From Ionization Alarms*
- *Of the Remaining One-Third – Only 15% Are Attributed to Flames*
- *Revised UL 217 Standard Is 2 Years Away From Implementation*
- *New UL 217 Still Allows Smoke Alarms With a 1 in 5 Failure Rate On Store Shelves*
- *New UL 217 Standard Does Not Help Homes With Exiting Alarms*

New York City Building and Housing Committee
Photoelectric Smoke Alarms

In closing……

- *CPSC Now Publically Acknowledges The Issue*
- *There Has Never Been A Wrongful Death Suit Involving Photoelectric Alarms but Many with Ionization Alarms*
- *Requiring 10 Year Anti-Tamper Alarms Alone Cannot Fix The Problem*
- *Changing to Photoelectric Alarms Would Save At Least 1,000 Lives Civilian Per Year and Reduce Risks to Fire Responders*
- *No Alarm Can Save Everyone – But Clearly We Can Do Much Better*

New York City Building and Housing Committee
Photoelectric Smoke Alarms

In closing.....

INT 56-A Will Not Only Save The Lives Of New Yorkers,

It Will Provide An Positive Example For All US Cites To Follow

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 56-A Res. No. _____

☒ in favor ☐ in opposition

Date: 11/12/15

(PLEASE PRINT)

Name: Richard Cantor

Address: NY Electronic Security Assoc

I represent: _____

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 56A Res. No. _____

☐ in favor ☐ in opposition

Date: 11/12/15

(PLEASE PRINT)

Name: RICHARD ROCHE

Address: 9 METROTECH

I represent: FDNY

Address: 9 METROTECH

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 56A Res. No. _____

☐ in favor ☐ in opposition

Date: 11/12/15

(PLEASE PRINT)

Name: LAURA KAVANAGH

Address: 9 METROTECH

I represent: FDNY

Address: 9 METROTECH

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 56A Res. No. _____

☐ in favor ☐ in opposition

Date: 11/12/15

(PLEASE PRINT)

Name: THOMAS MCKAVANAGH

Address: 9 METROTECH

I represent: FDNY

Address: 9 METROTECH

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 56A Res. No. _____

☐ in favor ☐ in opposition

Date: 11-12-15

(PLEASE PRINT)

Name: DONALD GOTTFRIED.

Address: _____

I represent: DEPT. OF BUILDINGS

Address: 280 BWAY, N.Y., N.Y.

Please complete this card and return to the Sergeant-at-Arms