Leadership in fire protection: an oral history series

Kathy Slack on residential sprinklers with Greg Jakubowski

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Greg Jakubowski - GJ

Kathy Slack - KS

GJ – Hi Kathy, it's good to see you today. I'd like to talk to you a little bit today about how you got into fire protection?

Caption: Kathy is the Sales Director for Keystone Fire Protection, a sprinkler installation and distribution company.

KS – That's an interesting story. Actually, I hate to bring up negative issues but my ex-husband was the banker for Central Sprinkler Corporation and every year they had a get-together, a sales party if you will, down at the beach in Fort Lauderdale. I attended that and had the opportunity to get to know Bill Meyer who was the President and CEO of Central Sprinkler Corporation and he and I hit it off right away. We started talking about fire sprinklers and what they actually did, how they protected and saved property and very surprisingly about two months after we had a meeting down in Florida and he called me and said I really enjoyed our conversation and I'd really like to talk with you in more depth about... what your vision is of fire sprinklers and how we can improve them. So, I did meet with him and I started talking about aesthetics and he said, "well tell me a little bit more about your feelings on that" and I said "I don't know if you're working with architects but I suspect that architects would really be opposed to the aesthetics of the current model of the sprinkler head. So I think the aesthetics really need to be improved." So we parted and the next day he called me and said "You absolutely have to come and work for me. We're going to do something about the aesthetics of sprinkler heads." And that's the kind of guy he was. He was a visionary. I was a visionary although I didn't know it at the time. And we shared that commonality. That's how I got involved.

GJ –So really up to that point you didn't have a lot of formal training and experience in the fire protection industry.

KS – none at all, absolutely none at all

GJ – But over the years you have developed this huge passion and extreme knowledge base about the fire protection business. How did that come about then? You started to work for Central and it grew exponentially…

Caption: Greg is Principal of Fire Planning Associates and Chief of the Lingohocken Fire Company in Bucks County, PA

KS – It grew exponentially, yes. I had some mechanical engineering background in school and I had a marketing education. So I think two disciplines, blended together, and I started leveraging them and my just natural curiosity about how sprinklers worked, what they looked like under fire conditions, how the sprinkler performed and the effect, the impact it had. That just made my curiosity grow more and more. And again having an ally like Bill Meyer who shared my interests and growing passion for making sprinklers more publicly desirable and attractive…. It all blended together. It all blended together Greg.

GJ – And that's a great story and I know you've been doing this a long time. As you started with Central and you started to grow into the business a bit tell us about how you saw the fire problem in this country and maybe throughout the world. Where people were dying, what was going on and maybe how Central could be a part of that solution.

KS – Well, in the late 70s, probably 1977, I had done a lot of work in the NFPA being a technical committee member, on several committees, and I was reading a lot about the fire problem. I have this natural inclination always to read more and more and more. And I was reading about the large percentage of fire deaths and where they were occurring…. they were occurring in the home. And one day I sat down in Bill Meyers' office; and I said "Bill, we have got to do something about this residential fire problem" and he said "You know honey, I've been thinking about that myself." So, it was always like that, I would be thinking of something and he was coincidentally thinking about it too. We started talking about it and I said… I have an idea. I'd like to contact the US Fire Administration. I've been reading about this guy named Harry Shaw and he's everywhere and he's trying to go out and cultivate interest among manufacturers to develop technology. You know you realize this is an unknown technology, we haven't identified it, …an unknown market,… although we know that 85% of all the fire deaths are in the home. So there is a potential market there. We just have to shape it. So I said, "I'm going to call Harry Shaw and I'm going to see if we can go down and visit him." So Harry Shaw said that he would love that visit. Bill and I took Amtrak down there. I was so excited I left my purse in the cab. And we got inside and spent the better part of the day with Harry Shaw and he encouraged us to write a proposal to Factory Mutual for grant money, for development. So I did. I wrote a grant proposal to FM and we received a grant of $50,000. Well, you know, that sounds really great, but we had no idea what the cost of this research would be. So, one of my best accolades to Bill Meyer was that he made that commitment without knowing how much over and above that $50,000 the company would have to spend.

GJ – And over time if you had to guess they probably spent millions on research and…

KS – absolutely, because the laboratories, UL and FM… you know, we were all in a learning experience together. We had to identify first of all the technology that would be appropriate for the home, which had a different type of water supply than a commercial property, but also the technology that would help us maintain tenability for human beings in the room of fire origin. Heretofore, the traditional fire sprinkler could not do that. And the NFPA actually had a set rule that… well, not a rule, but they accepted the fact that two people would die in the room of fire origin because of heated gases, toxicities. So this particular kind of new sprinkler technology

had to maintain and control carbon monoxide and heated gases, thermal conditions. We were really faced with quite a job in terms of identifying that technology.

GJ – And the initial concept I think was to try to prevent flashover in the room of origin, is that correct?

KS – Yes, that is correct, it really is.

Caption – The Concept of Residential Sprinklers

GJ – But as a firefighter we know that once a room flashes over it's really almost untenable for us, with all of our protective gear on, let alone for people. So I guess some of those things that I guess Central (Sprinkler) and Harry (Shaw) and some other folks tried to put together as far as tenability so that someone could literally be lying in bed, passed out, have a fire start and the sprinkler go off and they live thru it.. That was the concept you eventually got to right?

KS – yes, and it was the most exciting part of my career, because all of us collectively knew that what we were doing would have a great impact on a lot of people. So we had to identify the technology and then work with the laboratories to train them on how to test it. We almost burned Factory Mutual down one day. It was an incredible thing, we had flashover and it was frightening. We had a great research scientist there, named Dr. Kung and he was in charge of residential testing so I have fond memories of him because there was not much credit given to him in the story, so I need to give him that credit because he was a remarkable scientist. And he helped us to really understand that the criteria we had to think about carefully were how much water to put on the fire, in what pattern and how soon to put water on the fire. So eventually after trial and error we came to a point where we developed a sprinkler prototype that had a wide, flat pattern so that the water penetrated the walls, the adjacent ceiling areas and that was all directly related to the fire load in a residential setting being on the walls. … So the deflector was totally different from the commercial deflector. And then we talked about the link, the fusible link and at that time that's what we were using, a fusible link, not a glass bulb, and we discovered that the mass of the fusible link had to be dramatically less in size than the traditional sprinkler. So things came together probably after about nine or ten months and we determined that we had that prototype.

GJ – I like to teach folks when I talk to them about the differences between residential sprinklers and commercial sprinklers, particularly firefighters, that mass of the bulb you mentioned, it has to be smaller even though it's the same temperature at which the commercial sprinkler goes off at. I like to compare it to trying to boil a pint of water versus a gallon of water. It still boils at the same temperature. The link will still activate at the same temperature but the smaller amount will boil much quicker.

KS – And that's a great analogy Greg. The thing about the link whether it's a glass bulb or a fusible link is that there is a thermal lag built into a larger mass of a link or a glass bulb and that thermal lag really is the delay in time for the link to operate and the sprinkler to discharge and that's the critical time period that heated gases become extremely lethal in that room of fire origin.

GJ – And again when I talk to folks about that it helps to explain when you put that pot on the stove to boil even though the temperature underneath it is greater than 212 F it still takes time to heat that mass up to [temperature]... and that's really what we're talking about here with residential sprinklers and thermal lag…

KS – Yes, yes.

GJ – We also talked a little bit that you hadn't been in the fire service although you embraced it and came on and learned everything you could about it when you came to Central and you mentioned to me about when you saw at Factory Mutual a flashover it was frightening. Was that the first time you really saw something flash over at close…

KS – Yes

GJ – And I think many people in this country, they say, it won't happen to me, a fire won't happen to me. They've never seen that flashover first hand. We as firefighters have seen it and it scares us, even with the protective equipment that we wear. Describe for me about your feelings the first time you saw flashover, what we might even call the monster of fire.

Caption – Flashover experience

KS – It's an explosion. It's an explosion of fire energy. It's an explosion of all the gases in the room and … I was so shocked to see the power of fire in that particular stage. I was absolutely shocked and frightened by it as well. And I knew the first time that I saw it… I said, what happened? Dr. Kung said nodding his head, "Ah, middy, that is flashover." He was Chinese, he was such a great guy, but he called me missy all those years. And he spent a lot of time with me as a scientist describing the attributes of flashover. So I started thinking about what that would be like in a home and … it's complete loss of control. That is when you lose control of a fire and I couldn't imagine a family living thru that. So seeing that flashover gave me the incentive to work even harder on the development of the right prototype for the residential setting.

GJ – Once all of us who have seen the devastation that flashover can bring, whether it be to people, property or even firefighters, it'll burn all the equipment that we wear, we all get that passion to say "I don't want that to happen to someone." You had some huge results from the passion brought forth from seeing flashover that first time.

Caption: Working with the fire service

KS – Greg, yes, I did, I became very deeply involved with some large fire departments. The first one was Ron Coleman's department in San Clemente. He and I had met in 1980 in Fort Lauderdale during the time that Sonny Scarff was testing residential prototypes.

GJ – And Ron was Chief of San Clemente

KS – Yes, he was Chief at San Clemente at the time. He already had an ordinance in place but he was using concealed sprinkler heads.

GJ – So he was using technology that really hadn't been tested for that...

KS – Right

KS - … and Sonny was the head of fire protection at Marriott

KS – yes, and Sonny had a goal and it was given to him by Bill Marriott, who at the time had 20 hotels. And his goal was: "Sonny, here's the directive, I can never see a person die in a hotel with my name on it. I just don't want it to ever happen. So you need to find a way to guarantee to me that that will never happen. " So Sonny, was an old firefighter as well. For people who've never met him… I think of him as an earth mover, you know, everything's moving at one time. If there's a bucket in the front, that's moving, if there's a roller in the back, that's moving. You know, you need to get out of his way because he was a man driven to satisfy the directive that he got from a very powerful CEO of an organization that grew exponentially over a period of thirty years. Today they have some 4700 hotels.

GJ – And if we grow a business like that it's very easy to let safety and other things fall beside the wayside if you don't manage it properly and Sonny was intimately involved in making sure that didn't happen.

KS – right and so we all met in Fort Lauderdale and it was an interesting meeting. Grinnell was there as well and they'd been developing a residential prototype. Ron was an unknown to me at the time. We met at a cocktail party held by Grinnell and in my purse I had our prototype in a Crown Royal bag and Ron Coleman still remembers that to this day. I said, "step outside with me; I want to show you a really esthetically pleasing sprinkler head." It was our Omega prototype. That's where Ron and I met each other and he became a real mentor to me. .. about the fire service, the fire service needs, and I learned a lot about the residential fire problem in different communities.

The second community I really worked hard with was Scottsdale. The city of Scottsdale is a planned community; it was incorporated in 1949 with a planned expansion to 2049. So it was a really nicely planned [community], but only 20-25% developed at that time. Chief Bob Edwards was the fire marshal for the city of Scottsdale. He and I became involved with the city itself. His vision was that they could pass a zero-based ordinance. At least start with residential so that the city's capital expenditure for the fire department was lessened over the period of the full expansion of the city. We worked really hard together with a wonderful mayor, a gentleman by the name of Herb Drinkwater, who was an ally to the sprinkler protection concept that we had. And we also helped to grow the city council and to educate them. There were separate educational efforts being made in cities where it would be necessary to pass a residential sprinkler ordinance, all concurrent with the development of the technology.

GJ – Talk a little bit about those challenges of educating the end users, educating firefighters, some of the things you had to go thru. People look and say well, you're a vendor, it's in your financial best interest to sell us this product but at some point you have to bring home that flashover experience. Tell us a little bit about how you educated those folks.

Caption – residential sprinkler education

KS – yes, I'm a person who likes to plan but I also dive right into the process and I can be pretty bullyish if I want to as well. I knew that what we were doing was right. Therefore I took my adversaries, together with the Ron Coleman's and Bob Edwards of the world and we said we want you to come and witness a real fire without sprinklers and one with sprinklers. So we found dilapidated houses in this very tony city of Scottsdale. We actually had two brand new ranches that a builder gave to us. And they were fully sprinklered with residential prototypes, one was cpvc plastic and the other with copper and we had four days of testing. And I intentionally invited 400 major end users, and they included groups like the Hilton, Marriott's, the national security agency, the secret service, the architect of the capitol, you name it and they were there... state department... and all of them had very little faith in what I was doing. I said, "look, just come for four days in the sun, you have got to see this. You won't believe it." So they all came out. We probably had 350 people there. We had bleachers set-up, FM (Factory Mutual) was there. And we had four days of tests, one that incorporated a kitchen fire with a short in the Mr. Coffee; one was a grease fire in the kitchen. We had a Christmas tree that had been in the Arizona desert all summer, and if you have never seen a Christmas tree catch fire, it's an explosion, an explosion of needles. So we carefully instrumentated all of the tests, testing for eye level and ceiling level temperatures, gas levels... and over a period of four days, 350 believers stood there and said collectively "this is amazing technology." If this is so effective in the home what would it be like in my commercial applications? So there was another evolution taking place then. But it was really a process of education. And we were all really down and dirty trying to find places to set fires [demonstrations]. But we were careful about having goals for each type of scenario, [to ensure that] people really got faith in the product and the technology. We were careful in a way that we really wanted to measure the results. So we had highly accredited groups there, we had UL, FM.

There were [afterwards] a lot of fire tests that were then held over a period of probably 3-4 years.

GJ - besides Ronny, who then went on to become the California State Fire Marshal, and Bob in Scottsdale, were there other fire service leaders who had some visions or maybe you helped them to get some vision and got on board early on in the process.

KS - Oh, yes, there was Chief Dave Hilton, down in Cobb County, Georgia, and he had his, I will never forget it, his little wiry lieutenant named Jerry Grier, and there was a fellow named Dave Hester. The three of them actually drove a Winnebago out to the Scottsdale tests and when they opened the doors we had like five piles of Jack Daniels, empty, fell out of the back door... These guys were from a bedroom community outside of Atlanta and they saw too the impact that a growing population around that city would have on the fire department. So that was their goal, to help [with] the problem by installing fixed fire protection in the residential setting. I should also mention there was a fire chief in the city of Dallas, named Jerry Lambert, a very controversial guy who had in his city, a hotel called the Hotel Adolphus, a five star hotel, and he had installed a domestic fire sprinkler system in that hotel probably seven years before we'd even touched residential technology development. So we had, we had people with the faith, with the desire out there. It was a matter of bringing them all together so we could do something carefully and with credibility.

GJ - well, ironically, all that work that was done…now we're sitting today in a firehouse in suburban Philadelphia in a community that adopted a residential sprinkler ordinance about 15 years ago and today we're sitting here and about 25% of the homes are sprinklered and we've already had a sprinkler save here. So it's proven its value in communities across the country, not just Scottsdale, not just Cobb County.

KS - absolutely

GJ - through that process, and it was really a revolutionary process in fire protection, it's taking what traditionally fire departments do and changing it. They like big trucks and big water and putting water on things and going in and doing aggressive firefighting... Now we arrive and there's a little bit of smoke and a little bit of water to clean up and we're done. It's a whole different kind of perspective, that's hard for many. Did you meet any kind of resistance from those types of people?

KS - Absolutely, absolutely... You know some people say that part of a firefighter's mind is strictly pure testosterone but I don't believe that. I believe that firefighters and firefighting evolved over a period of hundreds of years and their job was to fight a fire. So the mindset had to change. The mindset shifted from fighting fire and fighting loss to prevention. And I think that many fire departments today who have introduced residential sprinkler technology to their communities are now in a different mode. There's nothing better than knowing that you've gone to inspect a house and it's got a fire sprinkler system in it because you know if there is ever a fire there there's a fixed system, a very silent sentinel that's going to take care of that fire before you maybe even get there.

GJ - Like the video that was done from [Fresno] California, I don't know if you've seen it, with all the firemen sitting in the house and having dinner, having water battles with the kids...

KS - (nodding) it's great, it's great, but Greg the other thing that's happening in the fire service is there's a lot of younger minds. The problems that I had were with the older fellows. You know a lot of the volunteers were older fellows, we live in an area that's primarily volunteer, but you know the career guys, the volunteers who had been around for a couple decades, they were impediments originally [70s, early 80s] with this technology. They really were impediments. But they became believers too I think... reluctantly.

GJ - And how did you help, because I know you did a lot of work to do that? You did end-user kind of things, demonstrations showing people that it works...

KS - Yes, absolutely, that's what we did. And we actually had the firefighters participate, in setting the fire, watching the fire, observing the sprinkler head activation and then we sat down together and talked about the amount of loss between the dilapidated house that was not sprinklered and the one that was sprinklered. So they said reluctantly, it's a pretty good thing. .. So I think people are intelligent, if you put the right information in front of them and you educate them they can figure it out and that's exactly what I think happened with the fire service, with the older fellows.

GJ - And we're seeing here, just here in this county, in the sprinklered versus the unsprinklered environment a 15 times difference in loss... sprinklered homes versus unsprinklered homes.. which is actually quite amazing. And it's great results for folks like you.

Let's talk about, besides the people, the challenges you had with the sprinkler heads. It's not easy to say, I have this idea, let's come up with this new type of sprinkler… we'll run it through a couple tests and sell it, sell lots of them. But there were some real obstacles, some real roadblocks that had to be overcome.

Caption - The Omega Sprinkler Head

KS - yes, there really were and there were many. The first one was the aesthetics. The homeowner would be more likely to accept an esthetically pleasing sprinkler head than one that was not, that was a standard sprinkler design. So I worked really closely with an engineer at Central Sprinkler Corporation. His name was George Polen and he was a brilliant young guy, he was a brilliant young man, and I spent a lot of my time going back to the engineering area and working with him and asking what we could do to create a design that's esthetically pleasing and futuristic looking. So I was defining the design, what I wanted to see. And he said “well, what do you mean by that?” Well I replied, “let's talk about it looking like a little space ship on the ceiling.” And he said "A space ship?" And I said, “you know what I'm talking about, we're talking about a design that's tapered, has some fluidity, really looks okay in a ceiling.” And he was a brilliant man. In the end he came up with a design and it was esthetically pleasing, it had an escutcheon that was tapered in toward the sprinkler body and had three little heat collecting fins to collect the heat and accelerate the response time.

So we were all together, the big trio, Bill Meyer, George Polen and myself, every single day we sat together at some office and Bill said "Well honey, what would you like to name this sprinkler head?" and I said, "it's the ultimate, it's the omega." So that's how we named the sprinkler head. But the aesthetics was number one.

Number two was defining how fast that sprinkler head had to activate and then finding the design that could fit into the aesthetics that we had defined. So it was a matter of knowing what the criteria was for activation and being effective in the room of fire origin in terms of tenability, then saying it's got to be esthetic, then putting it all together. It was very difficult. A lot of trial and error.

GJ - A lot of testing was done right.

KS - Oh yes, my goodness. We were spending money like drunken sailors, but that's when Bill Meyer's vision came in. He was a man of great vision. He said, "no, we're going to keep doing this, I don't care how long it takes, this will come together and I know that."

Caption - testing the Omega Head

GJ - how much did a test cost at UL?

KS - in that day they were cheap, but relative to the time period. You know we could go to UL with a fire test and it would be 9-20 thousand dollars.

GJ - And how many of them do you think you had to do...?

KS - Probably about 60.

GJ - So a lot, maybe millions of dollars to get that product to market. And eventually there were problems with the Omega head.

Caption - Omega Sprinkler Head Problems

KS - there were and I want to address that in terms of how I view technology. Technology is an evolution. That's what it is. So you have an infancy stage of it. And then you have a stage where it grows and plateaus off and it's well-defined. But I think the problems with the Omega can be attributed to the infancy stage. The initial design of that sprinkler head had a ceramic bearing disc inside of it and it had very little tolerance. It was a design that had the tapered escutcheon and a little barrel-like body which had a deflector which was held into the body with pins. And then there was a groove around the inside of the sprinkler head and ball bearings so when the fusible link or bulb assembly melted the pins dropped and you had sprinkler activation. Well that ceramic bearing disk had a more important role than what we really understood because we then went to a fiber-stamped operation which compromised the tolerance of the sprinkler head. So we did a lot of learning through that evolution but that's really how technology has to be viewed. It is an evolution.

GJ - and that's really true for any product that's out there as it grows quickly through the process and I think it's probably fair to say you were trying to work this balance of "we want to get water as quickly as possible on the fire" to maintain the tenability for the occupant while at the same time if we get false alarm problems from these things activating inadvertently we're going to turn the market off very quickly.

Caption - UL and FM Education

KS - right and the other thing I didn't mention is that we had to educate UL and FM. UL and FM were accustomed to the commercial sprinkler and as testing laboratories they liked to push residential sprinklers into that technology box. But it wasn't appropriate. So they had to come through with a test protocol for which I worked with them very closely. It was a temporary test protocol that we put out there. And we also had them take the design of this sprinkler head and put it through tumbling tests to test the durability of the head. So here we have a sprinkler head that we designed that had three fragile copper fins and you had to put it through a tumbling test. So there were all kinds of tests that had to be developed to challenge the sprinkler's physical and performance integrities..

GJ - And during the manufacturing process at Central every head would be pressure tested before it went out the door, is that correct?

KS - yes, that's correct (nodding)

GJ - So right on the line, and I remember watching the young ladies putting pressure on it to make sure it would do what it did. I guess just getting back real quick, as we get close to summarizing here, is that UL and FM testing, really until the residential sprinkler came about and these test protocols were developed, it's probably fair to say that sprinklers were really designed for property protection.

KS - absolutely.

GJ - that was the fundamental goal behind it, at the same time they achieved some objectives, they saved a lot of people's lives but that wasn't the primary reason for them. Once the residential sprinkler technology came into play, we really focused in on that, how could we save lives, how can we maintain the tenability and prevent the flashover.

Caption - Influence of Sonny Scarff

KS - yes, and don't forget that technology then evolved into the quick response technology and of all the people in this country that I believe have done more for the sprinkler industry than anyone else it would have to be Sonny Scarff of Marriott. Sonny Scarff is an individual that let's nothing get in his way. And this is a humorous story. Sonny decided to take a lot of buildings that were going to be razed, (because they were going to build on the beach at Fort Lauderdale or in San Francisco) and he would hold these wonderful fire tests but concurrently he had Grinnell installing unapproved prototype sprinkler systems in high-rise buildings. So he'd have all the fire marshals there who wouldn't know what was going on in their hometown and unbeknownst to them he was installing sprinkler systems. So he took a tremendous risk and I can recall just vividly being with him one time in Bethesda in his headquarters and he went into see his boss who was the risk manager, his name was Arnie and he was a great guy, ... Arnie was on the phone and Sonny had a document and motioned for him to sign it. About a month later Arnie asked, "what was that that I signed." And Sonny said, "oh, you were just agreeing that if the sprinkler systems didn't work in the Miami high-rise that we would just rip it out." "Oh my God", Arnie said. But you have to understand that Sonny took that residential sprinkler technology and he went to Shell Oil and to BF Goodrich and he bullied them into testing their resins for fire rating so we could have plastic piping in retrofit properties easier. We went to UL and we bullied them into looking at the residential technology and how effective it would be in the commercial setting.

Caption - Library of Congress Retrofit

KS - And that even evolved further because I got very involved with the Library of Congress retrofit, which was one of the most wonderful experiences of my life. It was one time in a hundred years they were going to upgrade the library (fire protection) and the book stacks were really the primary part of the sites they wanted to retrofit so we ended up developing with the librarians of the Library of Congress an on/off sprinkler that had the same kind of deflector design and heat collecting design that the Omega had. So things happened as a result of residential technology that not one of us expected.

GJ - Well I think it’s fair in summarizing that not only did Sonny take a lot of risk but people like yourself, people like Ronny took a lot of risk, Bill Meyer took a lot of risk over the time in this development process but today we're already beginning to see the benefits of those risks and over the long term the people in the country and throughout the world will reap the benefits of the risks that were taken by some of the pioneers.

KS - oh, I agree and somehow in my heart over those years I always knew it would be something that would evolve over time in this country and in the world actually. It has had a global impact. You know today it's a world standard to have a fast response sprinkler. It's the world standard. FM always wanted to wait to put water on a fire because it was a property protection device but they had it backward because it was about putting water on the fire quicker and reducing the loss. They have a vested interest in their insured properties. So now they have ESFR sprinklers which is early suppression, fast response. And that just bowled me over that FM would ever adopt that but I'm again starting to see younger minds and technology and development, certainly in the fire service, younger people who are starting to buy homes who have open minds to different kinds of ways they can live a better life.

GJ - and keep their families safe. Well, it was a pleasure talking with you today Kathy as always.

KS - thank you, we go way back and it's great seeing you again Greg.

End of interview