Mark Peterson - Host :

I'm Mark Peterson, and this is "Before, During, and After, a Podcast from FEMA."

Mark Peterson - Host :

FEMA has some tremendous programs to help firefighters and, in turn, assists with the safety and security of our communities around the country. We do this through our support to the fire community via the U.S. Fire Administration and the specialized training that occurs at the National Fire Academy. But, and the subject of today's episode, we also provide a tremendous amount of funding through FEMA's grants programs. So on today's episode, we're gonna talk about the distinct fire grants programs that fund critically needed resources to equip and train emergency personnel, enhance efficiencies, and support community resilience. But we're also gonna dive a little deeper into the unique aspect of our fire grants programs, funding research specifically through one grant recipient, Underwriters Laboratories, where scientists partner with the fire service to engage in research that can quickly have positive impacts in the field.

Mark Peterson - Host :

Alright, so later in the show we're gonna hear, you know, some of the tremendous successes that our partners at Underwriters Laboratory are doing with some of our firefighter funding. But to set the stage for what kind of financial assistance has been, you know, developed over the years and provided by FEMA through our grants programs, we're gonna talk today with Pamela Williams, the assistant administrator for FEMA's Grants programs, specifically about FEMA's fire grants programs. And so, Pam, welcome. Thanks so much for talking with me.

Pamela Williams:

Awesome, thanks Mark. I'm really excited to be here today and talk about our fire grant program because these are some of our most impactful grants that we administer through FEMA's preparedness grants. So, let me first walk us through the three major grant programs that we have under our Assistance to Firefighter Grant program. So, the main program is the Assistance to Firefighters grant program. These were established in 2001 under the National Defense Authorization Act, and that was actually just before 9/11. But in the immediate wake of 9/11, it became very clear that there were some serious capability gaps in the fire service. So with that realization, money actually started to flow into the program in much higher amounts. And it's now a large enough program that it has been broken out into these three separate grants. So, this first part really helps firefighters and other first responders build capability through obtaining critically needed equipment, protective gear, emergency vehicles, training, and other resources that are necessary to protect the public and other emergency personnel from fire and those related hazards.

New Speaker:

Another very, very exciting piece of the Assistance to Firefighters Grant program is the Fire Protection and Safety Grant program. This is what we call FPNS. So, this supports projects that actually enhance the safety of the public and firefighters from fire and related hazards. But the primary goal of the program is really to reduce injury and prevent death among high-risk populations. But, I wanna make sure to mention this because this is the area where we do research and development and we fund grants for research and development - so that R&D meaningful space that I hope you're gonna hear a lot about in the next part of this podcast. So, the entire goal of these research and development grants is to reduce firefighter fatalities and non-fatal injuries that improve firefighter health, safety and wellness.

New Speaker:

So, another area is Staffing for Adequate Fire and Emergency Response Grant program. So, this is known as SAFER, and this is where we actually get to provide direct funding to firefighters and Volunteer Firefighter Interest Organization to help them increase or maintain the number of frontline firefighters available in their community. So actually, funding firefighter personnel. The goal of SAFER is to enhance local fire departments' ability to comply with the staffing response and operational standards, those actual standards that are established by the National Fire Protection Association. So the fire grant is actually in its 22nd year now, and fire departments throughout the nation apply and the award decisions are actually made by their peers, so other firefighters, based on the merits of their applications and the needs of their community. So peer panels made up of firefighters from across the country actually help develop the criteria for these grants, review the application, and we use their feedback for grant awards. We are relying on the experts, the firefighters, when it comes to where we should drive this funding and who should receive this funding.

Mark Peterson - Host :

Yeah, and we do, and they do a great job. So alright, you rattled off a couple of really great grant programs and, you know, having been out here in the region for quite a while, we work very closely with a lot of fire departments and they are very excited about these programs. Specifically, Assistance of Firefighter Grants, AFGs. If you're in the fire community, they know what these are. And then, the Staffing for Adequate Fire and Emergency Response Grant program, SAFER. I like SAFER better, it's easier to say. But, oh my goodness, so impactful throughout all of the communities throughout the country. It's really a fantastic program. And then, like you said, we're gonna talk a little bit more about funding that comes out through the Fire Prevention and Safety Grant program, the FPNS. So, I mean, there isn't really a week that goes by that we aren't connected with the fire departments on these programs to explain and provide some technical assistance because they really are very important to the safety and security around our communities. So with that, it really comes down to money. And so, you know, Pam, it sounds like, and we know that there's a lot of important work supported with these grants so, how much funding has FEMA issued in fire grants?

Pamela Williams:

Well, in just the last few years. So, let's talk about from fiscal year 2015 through last year, 2021, we've actually awarded more than $5 billion across almost 80,000 awards. And that's just in the past few years. These grants are one of our most popular grants. But due to the high demand, we only fund about 22% of the applications submitted. So, less than a quarter of the grants submitted will actually get funded. And so, that is one of the greatest challenges of these programs. We have really tough decisions to make as to who receives a grant award because the demand is so high and there are limited resources for a tremendous need across the country. So, since 2001, the fire grants have been meeting the needs of fire departments across the country. But one of the most exciting things is - these resources are going to some of our most underserved and rural communities.

Pamela Williams:

And while there has been no geographical formula set for the distribution of these grants, when we've sat back and evaluated the application, we've seen that all sorts of departments - whether they're paid, volunteer, are combination, they're all represented here, the geographic response area, the type of community served, whether it's urban, suburban, rural, all of these things are taken into consideration in the application. We are trying to build a fire department capability based on where there's a need and where that need is not currently met. So, we know that a firetruck being purchased by FEMA fire grants goes a long way in a community where they don't have enough firetrucks. And it makes a big impact even when it's just a smaller grant.

Mark Peterson - Host :

It absolutely does. And you know, I wonder, obviously we're gonna talk about sort of the R&D component that you talked about, you know, maybe, a little bit ago. But I'm wondering, if you could just kind of give me a sense of some other successes where these grant programs have really, you know, parlayed into some really effective assistance for the fire community.

Pamela Williams:

You don't have to look very far to find some really tremendous success stories. So I'd like to share some across the various aspects of the program. So, let's take the Massachusetts Department of Fire Services. So they've actually used AFG funds to invest in a mobile extraction unit to inspect, test, and track personnel protective equipment, so that's PPE, that's worn by staff and students at their three training campuses. So, the mobile extraction unit's capability actually helps produce a better understanding of the specific toxins that are created in an academy environment where they use straw pellets and gases as the primary fuel materials. But this is actually going to have a major effect on the health of the Massachusetts Fire Service because they're able to study those kind of things.

New Speaker:

But let's take SAFER grant, where we've talked about actually being able to augment staff in a specific location. So, the fire department in Eagle River, Colorado was tremendously understaffed through a safer grant, they were able to add nine additional firefighters - three additional firefighters per shift, to their ranks. And it was not a moment too soon because, shortly after they brought those firefighters on board, they responded to a fire at a mobile home only to find out that the nearest fire hydrant was frozen. So, they desperately needed more boots on the ground to handle that threat and connect to another fire hydrant before other nearby homes could catch fire. But thanks to the additional personnel that they had, they were able to make it work and put out the fire before it's spread. Of course, there are many other ways that this grant has helped that particular fire protection district, and we hear that the additional firefighters have made it possible to do even more community events - events that help target our children to learn about fire safety because we know that the most important thing is to get information into the hands of our children so that they know what to do when fire strikes in their homes. So, that's pretty important.

New Speaker:

So, another great success in the area of FPNS with the Research and Development Grants is, unfortunately, we know that firefighters face a much higher risk of cancer than the general population but, often, they're not able to access the preventive care that they need. So, through some of our research that has been funded, it's helping establish the link between firefighting and cancer. And additional funding is helping to determine the association between some specific circumstances of exposure and forever chemicals and specific types of cancer - so, adding a further nuance that helps with additional screening guidance. So, when we examine issues like inhalation of respiratory particles, dermal exposures from firefighting, and overhaul activities and fire investigation with - which it affects a huge range of fire service occupations, whether it's career volunteer wildland and fire inspectors, we really start to see how this research and development funding can be transformational for the fire service.

Pamela Williams:

So, I'd also like to mention something that's really, really important to us. A big challenge for the fire community is building codes. And buildings are a refuge and our safe space, but sometimes, if they're not built to standard, they can pose a danger to us. So, the FPNS program funds projects focused specifically on building code enforcement and awareness. And these projects focus on first time or reinstatement of code adoption and code enforcement, including communities with wildfire risk. So again, these grants are helping fund making our communities safer. So, the last example that I wanna give you is, because I love to end with some really good old-fashioned statistics that highlight the number of lives these initiatives are changing and the tremendous partnerships that they're helping forge, initiated largely through the support of another FEMA FPNS grant, the American Red Cross launched the Home Fire Campaign in October of 2014, and this campaign had the goal to reduce fire related deaths and injuries across the United States. And as of June of last year, the Red Cross has made over 1 million households safer, installed over 2.4 million smoke alarms, and has successfully documented over 1,356 lives saved over 866 of those being youth. Countless others may have experienced being saved from a fire, thanks to the hard work of Red Cross volunteers, partner volunteers, and the financial support provided by FEMA, these grants are truly transformational.

Mark Peterson - Host :

It's really incredible stuff and it's like, one of those areas I think in government where we know that we are, you know, helping communities with our grant programs, whether it be mitigation or, you know, our preparedness grants, but man in fire grants, it really, you see a dramatic impact. And, and thank you Pam for, you know, kind of talking us through some of those programs that are out there.

Pamela Williams:

Awesome. It was a pleasure to be here. I am so excited that you get to hear from Steve. He is truly dedicated to the fire service, particularly through research and safety, and I'm excited that folks get to learn more about what we're able to do through these grant programs.

Mark Peterson - Host :

If you've ever used a hair dryer or a string of holiday lights, you've probably seen Underwriters Laboratories UL mark on the label around an electrical cord. In addition to its work in consumer safety, UL Solutions focuses on the science of fire as well as health and safety of firefighters. Today, I'm speaking with UL Fire Safety Research Institute, Vice President and Executive Director, and 13-year fire service veteran Dr. Steve Kerber.

New Speaker:

On the FEMA podcast, we often talk about the usages of grants, and a lot of times we're talking about mitigation grants. Sometimes we're talking about Homeland Security grants and at times we talk about fire grants. And of all of those different conversations, one of the most unique ways that our grant funding is being utilized might be through Underwriters Laboratories Fire Safety Research Institute. And so, I'm so thrilled to talk to Steve Kerber from the Institute. Steve, thanks for joining me.

Dr. Steve Kerber :

Oh, my pleasure, Mark. Thanks for having me on the podcast.

Mark Peterson - Host :

Alright. So, I'm not sure many people have heard of the Fire Safety Research Institute. So, why don't you go ahead and tell me a little bit about the Institute and maybe how long it's been around and what you're doing there.

Dr. Steve Kerber :

Absolutely. So, the Fire Safety Research Institute's been around for I guess a little over 10 years. We are a part of UL Research Institutes and many people have heard of Underwriters Laboratories. Underwriters Laboratories has been around; I think, we're coming up on our 130th anniversary. So, UL got its start when electricity was first being introduced into the country. And we've developed standards and tested to those standards for the last 130 years. So, you might notice a little UL in a circle that you see on a lot of products in your home or in your workplace and things like that. We've evolved quite a bit since then. And one of the ways we've evolved is that we now have a nonprofit public charity component called UL Research Institutes, and we do research to make the world a safer place. And FSRI serves that mission really by, we tackle all of the existing fire safety challenges and try and get ahead of all of the emerging fire safety challenges that are ahead of us to try and make the world safer.

Mark Peterson - Host :

Now, normally I would give a plug, a website plug, at the very end of a conversation but, for anybody who's listening that might wanna take a peak at some of the images of what's happening at the Institute, they can go to fsri.org and see some of the really great visuals. But, give me just a little bit of a, if you will, an audible tour of what the facility looks like. What are we thinking about here?

Dr. Steve Kerber :

Yes, we are very visual. We burn a lot of things and a lot of that research is done with the fire service. And, fire service is very visual learners. So really what we've learned through doing research with the fire service for the last 15 plus years is that you need to replicate their work environment. They need to see what they respond to in the street as part of the research, if they're really gonna buy in and change behavior and accept the results of that research. So, we've got a facility here in Columbia, Maryland where we look at things in a molecular level and are able to look at combustion gases and how materials burn and break down and things like that. All the way up to our facility outside of Philadelphia where we have a small neighborhood built and we can look at how fire spreads from one structure to the next structure.

Dr. Steve Kerber :

We can look at every firefighting tactic you can imagine. We also look a lot of fire investigation, how fire burns and spreads, and how to determine that after the fact and into computer modeling and the wildland urban interface. So, we've got a lot of topics and if you go to the website, what you're gonna see is a lot of things on fire and a lot of measurements being made during those fires to understand what's going on and what might be able to be done to either prevent it or learn how to handle it the most effective and efficient way possible.

Mark Peterson - Host :

You know, having friends and family in various fire services, one thing that really sticks out to me is the ingenuity of firefighters in solving problems that they're faced with. And so do you, tell me about the people that work at the institute, do you bring in firefighters? Do you have them on, you know, on staff? Who are the folks that are doing the work?

Dr. Steve Kerber :

Sure. All of the above. I mean, me personally, I grew up in a firefighting family. My grandfather was a fire chief. My dad runs a fire training academy. I joined the fire service when I turned 16 and studied fire all through school, went to the University of Maryland in the Fire Protection Engineering program. And one of the great things about that program is, you live in a fire station while you're going to school. I joke, the only reason I got my master's degree and continued on to my Ph. D. was because it was a requirement to be a student to live in the fire station, and I wanted to do it as long as I possibly could. So, we've got a lot of fire protection engineers that make up our team. Some of those are volunteer firefighters on the side.

Dr. Steve Kerber :

Many of them have been doing research with the fire service for so long, they might as well consider them part of the fire service at this point. And then, the other half of our team is what we call our research amplification team. So, we put a lot of investment into getting the results of the research out and also bringing people along during the research so they can see what goes into it. They can see the rigor behind it. They can watch the houses burn. They can learn what's going on. And then, we make sure that every output of our project gets into the hands of the people that it's meant to impact. It's not a report that's on a shelf. It's typically an online training program, a series of presentations, a lot of video so that people can take what they learn from the research and apply it in their jobs.

Mark Peterson - Host :

So, I want to get to some of those, maybe, examples of how your research has influenced real world applications. But I wonder if you could just, maybe, talk a little bit about where you're at with the mission of the Fire Research Institute and the goals that, maybe, the Institute has.

Dr. Steve Kerber :

I mean, working with the fire service, one of the great things about that is you stay on the edge of what the challenges are. So, we're hearing from the street every single day. Right now, it's constant phone calls about things like lithium-ion batteries or fighting EV fires, or I've got EVs in garages, all kinds of sustainability concerns, cancer concerns and things like that. So we've got, I mean, our staff has grown tremendously. We're up to a team of, I think close to 60 people, and we've got more than 20 research projects going now at any given time trying to tackle all of those tough challenges. Just came off of a week-long trip with the U.S. Fire Administrator and other fire safety leaders on the West Coast where we went to three cities talking about the challenges of wildland urban interface fires.

Dr. Steve Kerber :

Now, we've got firefighters that are trained for structural firefighting that are finding themselves in a situation where it's not one structure on fire, it's many structures on fire, or that they're having to protect a structure that's being assaulted by fire embers and things along those lines. Because of all of he climate change and things like that, we're experiencing, which is really just the fire service in a nutshell. I mean, they're constantly evolving to adapt to the changes that get put in front of them and their workplace is just changing all the time.

Mark Peterson - Host :

Yeah. Obviously no shortage of those challenges out there. So, let's talk about the intersection of FEMA grant dollars the Fire Grants program and how you're utilizing that money. You know, what is the process that you follow for achieving those funds and then specifically, what projects are you utilizing them for?

Dr. Steve Kerber :

Yeah, the, the funds have been tremendous at being able to solve fire service issues. Back in, I think about 2005 when the program first started, there was not much research being done with and for the fire service. Actually, research was very foreign to the fire service at that point. So, I mean, we actually, get UL got its start in the fire grants actually by getting a phone call from some folks at FEMA and USFA saying, "Hey, we've got these issues. You've got some interesting facilities. You guys should consider applying for this new grant program that exists." And really that's been amazing evolution ever since. We're finishing up our 14th AFG grant as we speak on a training fire exposure project right now. But, if you go all the way back to the beginning, it's been topics such as structural stability of engineered lumber.

Dr. Steve Kerber :

So, as we've started to build our homes in different ways and using lighter materials it presented new challenges. Some firefighters were falling through the floor and dying in fires. So, we ran a large research project on that and many others since then. I mean, we can get into all of them, but I think it allowed UL to go into a group of stakeholders that we were kind of passively interacting with over time through standards and things like that to actually dedicate an entire team, full-time, to solving fire service issues. Back in 2005, we had a team of one, and now we've got a team of 60. AGFG grants used to be all of the funding that we would put towards fire service research and now it's a tiny, tiny fraction. So, it's actually convinced us, as a safety science company, that the fire service is a really important stakeholder group and we need to invest a lot more into their safety and effectiveness if we're gonna fulfill our mission.

Mark Peterson - Host :

So, with regard to the grants themselves, do you, sort of, hear about problems that are out there and then you know, put together, you know, the grant proposal to tackle a particular problem with that grant? Or, how does that work? Is that the process?

Dr. Steve Kerber :

That's a great question. We actually are guided by an advisory board. So our advisory board is made up of what we consider fire service experts from around the world. And we're constantly taking the pulse of what are the challenges out there, what's new, what's coming down the pipeline. The other great part is being part of, adjacent to a testing and certification company, we're seeing new products get submitted on a regular basis and we're constantly having to see what do standards need to be created for, because something's being sold into the marketplace, or something's being installed in homes, or whatever the case is. So, you put those two things together and you've kind of got the leading and lagging indicators of what are the problems out there? Where is the fire service getting hurt? Hopefully not being killed yet, but trying to get ahead of those things. Whereas in the past it was always, well, we've had a dozen firefighters die, can we look closer into this? Now it's, well, we think there's potential for harm here, and we don't quite understand how to respond to it. Let's look at that before it becomes a deadly problem.

Mark Peterson - Host :

I'd love to talk about the engineered lumber example. Tell me a little bit about like how that came to be and then what the problem set was that you were looking at.

Dr. Steve Kerber :

Yeah, so it really came to be after a couple high profile incidents of literally a fire in the basement of a home. The firefighters go through the front door to attack the fire and feet inside that house, they fall through the floor and burn to death. Clearly that's not something we want to have happen. And there was a trend that was kind of saying, well, wait a minute, we're building homes differently so, what used to be a dimensional piece of lumber, I mean, if you go in a early 19 hundreds house, it would actually be floor joists that are two inches wide by 10 inches deep, and it was literally cut out of a tree to what we now describe as we replaced mass with math. So, the building industry was running out of full size trees to cut floor joists out of. So they did what they do really well and figured out how to use geometry and the materials that they have to make something that is as good, if not better.

Dr. Steve Kerber :

So, they started creating engineered eye joists. So you now have a inch and a half or two inch thick eye, and then the web is thinner. The web is typically a piece of OSB that's only a half an inch thick. So, you can imagine if you've got fire burning on both sides of that, it takes a little bit longer for to burn through two inches of wood than it does to burn through a half an inch of wood. So, what we saw was that where firefighters might have had 20 minutes or more when they had a fully involved fire insulting that floor system before collapse would happen, now, we were seeing six minutes or less of collapse time. So, that was starting to explain, wait a minute here. If we've got a fire service that's counting on 20 minutes of operational time and now all of a sudden they have six or less, with the caveat there being, the fire service typically doesn't know when the fire starts, they don't know when their time zero is.

Dr. Steve Kerber :

So, they have to read the structure as they arrive and take the cues and try and size it up and understand what to do. And we started getting closer to demonstrating and showing them that you almost have to treat some of these new structures like they're gonna collapse. So if it is, in fact, have the potential to collapse, what does that mean to your tactics? What might you do differently? And in some cases, people might take their hose line to a different place, or like we like to say, you fight the fire on the level that it's on. So instead of going into a front of a house and going down the steps to fight the basement fire, go around to the back, gain access on the level the fire's on. That way, if the floor is not stable, you at least knock the fire down and you don't have the risk of falling into it. Or if your colleagues that go into search do fall through the floor, at that point, they're falling into a wet hot mess as opposed to an inferno.

Mark Peterson - Host :

So, that's maybe an example where you understood a problem and it changed the tactics of the firefighter. Right? Did it also change building codes as a result of that research?

Dr. Steve Kerber :

Absolutely did. So, the current international residential code requires a half inch of gypsum wall border equivalent on engineered floor systems. So, that's a great example where working hand in hand with the building industry and making sure that everyone's acknowledging that there's been this change that happened, that even though it might require a little bit different cost, it's worth it in order to protect our first responders to make sure that they don't have this new challenge to deal with. So, some places that change in the code has been amended out, but for the most part it's stuck in a large portion of the country.

Mark Peterson - Host :

Do you also look at, or have you looked at, sort of, the tools and the equipment that firefighters are using, not just the environment that they might be faced with? I mean, that's - the engineered lumber is a great example of that, but just the safety equipment that they're using.

Dr. Steve Kerber :

Absolutely. We've done a lot of research with their turnout gear - how heat moves through their turnout gear and how it protects them. We've done work with different nozzles and hose line combinations and understanding how to apply water best. We studied positive pressure fans which is a, essentially, a high-powered fan that blows into a structure during a fire to kind of control where the fire goes and to get smoke out of the structure. So yeah, that's been a big area for us as well. We wanna make sure that the tools they have available to them have been evaluated in an environment in which they're gonna be used. This is something that commonly gets overlooked where some company will come up with some new widget that they swear will help and save the fire service, but at the end of the day, they might take it to a firefighter training academy or something like that and try it in their training prop, which by design can't represent the actual environment it's gonna be used in.

Dr. Steve Kerber :

So, in your training prop, you might have a concrete building that you can burn some wooden pallets in for training, because we need that training to be safe so we're not killing firefighters in training. Well, it's gonna be different when the sofa and the bed and all the plastics and synthetics are on fire in a house. It was actually, we've discovered on multiple occasions, where the radios or the past devices that sense that firefighters are not moving to help find the firefighters are not designed for the environment that they're gonna work in. So, things that heat up because they have silicone semiconductors in them that as they heat up that semiconductor becomes a conductor and the device no longer works, but then it cools down outside and then it works perfectly again. So, that was a big learning, "Hey, we need to insulate this equipment or make sure this equipment's gonna work when it's most vitally needed." And, we've incorporated a lot of those components into these AFG grants.

Mark Peterson - Host :

Yeah, that's incredible. Just hearing you talk about all these advancements, I'm just, I'm so interested in how you actually take that research and the findings that you have and actually parlay it to the firefighters themselves so that they can be safer and maybe have better tactics. How does that work?

Dr. Steve Kerber :

It's probably the biggest challenge we have. It's the biggest challenge that anyone that works with a fire service has. By its nature, the fire service is a very fragmented industry. It's very local. So you've got 30,000 fire departments ish in the United States, and we joke that they do business 30,000 different ways. So, if you go and get an opinion of a couple fire departments, you got exactly that. You got a couple opinions of a couple fire departments. What we've been able to begin to break down with our research is allowing them to understand that the physics of fire are the physics of fire. Fire dynamics are fire dynamics. It doesn't care who you are, it doesn't care where you are. Fire burns the same in New York City as it does in Podunk, Iowa. And, allowing them to understand their work environment and understand the cause and effect relationships of their tactics.

Dr. Steve Kerber :

Now, what might be different is how a structure's built, the type of a structure, the staffing that you have to respond to those fires might be different. However, the fire does not care about those things. It's gonna follow a set of rules. So, we've been able to use the science and the results of the research to be able to break down some of those, "Well, that works over there, but it's never gonna work over here because we're different." It's like, whoa, whoa, whoa, let's break it apart. Let's understand what might be different, what is not different, and make it so we can learn from each other a little bit better. So, that's been, kind of, a huge breakthrough with the fire service. And really it's been consistency over time that many groups and organizations have come up to help the fire service, if you will, or they do one research project and then they go away.

Dr. Steve Kerber :

We've been able to consistently be there for over a decade. So, we've become kind of trusted. And we've also understand all of the outlets that are available to us. I mean, all of the magazines, all of the peer reviewed journals might be great to advance the science, but there's not a bunch of firefighters sitting around a kitchen table reading peer reviewed science journal articles. So I mean, I mentioned earlier our research amplification team. So, I like, we kind of have a mantra that we do research with the fire service, not for the fire service. So, every single one of those 14 AFG grant projects that we conducted we're typically a two-to-three year study, apiece. They are led by a fire service technical panel. So, at the very start of the project, we recruit - I mean, we typically get hundreds of applicants for 20 spots.

Dr. Steve Kerber :

Because the fire service wants to be a part in shaping their future and leveraging the research to learn more. They become, essentially, part of our project team. So, all of the experimental design, what we choose to burn, how we choose to burn it, the type of structures, the type of equipment, all of that stuff, we work together and figure out what's gonna give us the best bang for the buck in answering whatever this challenge is. I mean, some examples - solar panel systems. So, we would bring together experts in the solar industry, experts in the fire service in tactics, maybe some departments that have responded to these incidents and things along those lines, as well as electrical experts in science and things like that, and bring everybody together to scope the project. And what we've found is, when you approach it that way, not only do you get a better thorough result, you also get a set of champions on the end of the project. They're gonna help you take those results and get them where they need to go. So, it might not be me as a researcher out teaching the results of the study. It might be our firefighters that are out teaching the results of that study because they were intimate with the study all the way along. They feel confident answering the questions and tackling the hard questions that most people are scared of when no one wants to try and be an expert and then, you look silly because you don't know the answers to the questions that are gonna come as a result of your PowerPoint presentation. So, that's really been a focus for us is making sure that, I mean, as we speak toda,y the Fire Department Instructors conference is going on in Indianapolis, Indiana, and - one of the largest fire service conferences in the country.

Dr. Steve Kerber :

One of our young engineers, Keith Stakes, who's also a volunteer battalion chief in Montgomery County, Maryland, he's being presented with the International Instructor of the Year Award. So, there's thousands of fire service instructors out there. They're giving the award to an engineer because of the ability to translate the science to the street is really where the impact happens. So, really proud of him and excited. And, that's kind of a tangible example that we've almost become a de facto research arm of the fire service because of this AFG grant program.

Mark Peterson - Host :

Yeah, absolutely. It sounds like it. I mean, honestly, I feel like I could have questions for days. I mean, the work that you're doing is so interesting and incredible. Maybe before we conclude, give us a glimpse on what the institute's working on now maybe, where you see it going in the years to come and how the AFG grants can play a role in that.

Dr. Steve Kerber :

Yeah, I mean the, the challenges that we're tackling right now, some of them revolve around firefighter cancer. So, the health issues that the firefighters were faced with today is very different than they were in the past. We're seeing cancer rates in the fire service that are astronomical and well above what they should be. So, a lot of the questions start coming out of that, "What do we do about it?" And there's a number of things that they can do as they go about their business, whether it's how they clean themselves, how they clean their equipment, the tactics that they use on the fire ground could change the exposure that they have. Of course, their life safety mission does not change. They are still going to do what they need to do to save lives, but there's really some scientific evidence-based things that they can do after a fire, after an exposure to make sure that, hopefully, they live longer into their retirement like they deserve.

Dr. Steve Kerber :

That's a big topic. There's still many fire dynamics topics of how certain tactics impact certain fires and certain types of structures, things like we start building buildings differently. So, you're gonna have like tall wood buildings, so you got a 20-story wooden highrise. What's different from a hazard perspective and what's different from a firefighting perspective? Certainly sustainability is playing a big role. So, we're starting to see energy storage systems wind up in many different places. And the firefighting tactics with those, there's a lot of hazards associated with those. The incident in Surprise Arizona that happened a few years ago almost killed a crew of four that were investigating that incident and they weren't trained or didn't know what the hazards were at the time. We're starting to learn better now. EV firefighting, micro-mobility fires. I mean, a day does not go by where you don't have an e-bike or an e scooter on fire and a structure in a city somewhere.

Dr. Steve Kerber :

I mean, New York leading the way in that with five fire deaths so far this year and exponentially increasing. But I mean, these all come down to, how do we make the fire service so they don't have to gain the experience that they need in the street in real time with the potential to be hurt or killed. We need to be figuring these things out in a research environment so that we can get ahead of them, really understand the problem and disseminate that information in a way that gets ahead of the issue. So, there's countless issues that we're being faced with. I mean, one of the cool things about fire is that it's very cross-disciplinary. Every new technological advancement brings a new fire problem. One of our guys just was finishing up an article on data centers here on the east coast, particularly in the Virginia area, most of the internet is run through data centers.

Dr. Steve Kerber :

So, now you got the fire service responding to multimillion square foot data center buildings with lithium-ion batteries in every rack. And you've got as many racks as your eye can see. We're seeing huge warehouses everywhere because we need two-day delivery on everything across the world. So, now you're having 5 million square foot warehouses stood up in an area next to a highway that's protected by a small volunteer fire department, with automatic retrieval robot systems inside of it. And it's like, how do you deal with that? What are the challenges with that? And, and certainly the lithium ion batteries make it so what used to be, "Oh, it has to, the fire came from an electrical source on the wall." No. Now it could be a lithium-ion battery powered razor or toothbrush in the middle of a plastic stacking warehouse system that lights the place on fire and it brings new fire protection hazards, it brings new firefighter hazards.

Dr. Steve Kerber :

The list goes on and on and on. And then, throw the wildland urban interface on top of that where, it is incredibly complex and whether you could have firebrands and embers that are five miles from where the fire is in the trees, going into a community that's thousands of homes built four feet apart, made of plastic that are going to catch fire, and the fire department's gonna show up with a hundred houses on fire and not the resources on how to deal with that. So, how do we educate them and prepare them in such a way that they can do the best good for the community and educate the community that they've got a huge role in fire safety as well. That's another big challenge we have ahead of us. But lots of exciting topics

Mark Peterson - Host :

That is for sure. And, you have a big task in front of you, and I really appreciate you sitting down and talking a little bit about, sort of the, you know, even the incremental ways that FEMA's programs have helped you advance that really important work. So thank you.

Dr. Steve Kerber :

Yeah, I think the AFG program, since its inception in 2005, has created a paradigm shift in how research gets leveraged to learn more about the challenge of fire and ultimately firefighter safety. It's really created kind of a, a golden age of research that wouldn't have existed otherwise.

Mark Peterson - Host :

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