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FUSIBLE LINK

November 2019

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President's Message....

I want to thank Eric Olsen and Cicero Aidar from the Chubb Global Learning Centre in Branchburg, NJ for hosting our chapter at their tremendous facility for our annual field trip. 40 of us, including students from New Jersey City University and Lincoln Tech spent over 2 hours viewing demonstration of all types of water-based fire protection systems along with a live fire sprinkler activation. They also demonstrated the sprinkler flows from different types of fire sprinkler heads from low flow NFPA 13D residential heads to High K factor heads used in warehouse applications.

They also showed us how the insurance carrier is using Internet of Things (IoT) technology to prevent or mitigate some of the most common causes of substantial insurance claims. I encourage everyone to take advantage of the training classes that Chubb offers at these unique New Jersey facilities.

On Monday, November 4th Lucas Kirn PE, Engineered Corrosion Solution will be addressing Corrosion Management in Fire Sprinkler Systems.

Paul

Chapter President

Minutes of October 10th, 2019 Meeting

We held a different type Chapter meeting in October. We met on Thursday, Oct. 10 at the Chubb Global Learning Center on Columbia Road in Branchburg. President Paul McGrath convened the meeting at 5:00PM with introductions. There were about 40 in attendance, including many student and faculty guests from Lincoln Tech and from New Jersey City University. Paul made a few introductory remarks followed by dinner. After Mr. Cicero Aidar and Eric Olsen gave an enjoyable and informative tour of Chubb's Global Learning Center.

They displayed and discussed fire pump water supplies and many types of water based sprinkler systems. Explaining that for water based fire protection (described to be the best) to be effective there must be sufficient quantity (flow/gpm), pressure (psi) and duration (time) available. They described fire pumps as being the heart of systems since pumps provide pressure. They conducted a demonstration fire test of an alcohol pan fire under a conventional ceiling sprinkler in a booth instrumented with detection equipment so we could watch the operation of the sprinkler on the fire and comparative performance of the detectors. They flowed and measured water from a fire hydrant through a diffuser making pitot measurements. They also explained basic fire pump equipment and performance and demonstrated a flow test using an in line flow meter.

Perhaps the most memorable series of demonstrations was when they flowed water through several different style and orifice size sprinklers, some at different pressures so we could see the differences in sprinkler discharge.

The meeting was adjourned at 8:00PM. Special thanks to our knowledgeable and accommodating hosts.

Submitted by

Joe Janiga, Secretary

Introduction to November 4th Speaker, Lucas Kirn

Lucas Kirn will be speaking to us about corrosion in water based fire sprinkler systems, the special case of galvanized pipe corrosion and nitrogen inerting for dry and preaction fire sprinkler systems. He will also discuss benefits of using automatic air vents in wet pipe sprinkler systems and nitrogen inerting in wet pipe systems. Finally he will review the corrosion protection guidelines from several industry standards.

Lucas Kirn, Director of Engineering at Engineered Corrosion Solutions

Lucas Kirn has practiced in the fire protection industry for 16 years with experience in fire protection system design, code compliance, and corrosion assessment and consultation. Mr. Kirn received his B.S. in Fire Protection Engineering from the University of Maryland – College Park and is a registered Fire Protection Engineer in the state of Missouri. He is currently the Director of Engineering and Fire Protection Engineer at Engineered Corrosion Solutions, LLC. Mr. Kirn is currently a member of the Community Outreach and Advocacy (COA) Committee for the Society of Fire Protection Engineers and has published multiple articles on the subject of fire protection systems and fire sprinkler system corrosion.

NJSFPE 2019 Grant Winner

Jim Loftus presenting Grant award to Chief Andre Williams and Deputy Chief Crosby of the East Orange FD for their award. Grant will supplement their Fire Safety Program focusing on developing and teaching fire emergency operation procedures to the over 8,000 Seniors living in the City of East Orange, a population of 65,000 over less than 4 square miles and 20+ high rise buildings.



The SFPE NJ NY Metro Chapters Education Foundation

The SFPE NJ NY Metro Chapters Education Foundation held the 2nd annual Technical Conference October 3rd at the Westchester Marriott in Tarrytown, NY. Attendees were from both the Fire Protection Engineering and local Architect communities. Seminar organizers assembled a schedule of great speakers which presented current topics which included recent ESFR sprinkler testing by Chris Gates and Leo Ramo, changes to Health Care facility fire protection by Michael Crowley, a history of Code Development by Carl Baldassarra, an update from JCI on Special Suppression System Technology, an analysis of Structural Fire Protection by Qianru Guo, PhD, and a presentation on large scale testing regarding the dispersion of natural gas in structures by Noah Ryder, PhD. Michael Crowley, who is also the new SFPE International President also gave a briefing of what SFPE is up to and has planned for the new 5 years. The days events were both educational and insightful. The Foundation would also like to thank conference sponsors UL, WJE, Johnson Controls, Viking, Risk Logic, Stony Creek Brewery, Thimble Island Brewing Co., Captain Lawrence Brewing Company, New York Comedy Club, NFSA, United Fire Protection, NJ Chapter and the NY Metro Chapter. Note: Proceeds from the Conference benefit the Foundation grant and scholarship programs.



AFAANJ and NJSFPE are pleased to announce that they are accepting presenter proposals for their *11th Annual Spring Technical Symposium* to be held on April 22nd at the Hanover Manor in NJ.

The Annual spring symposium is a day-long education, training and trade show event for the Fire Protection Industry.

This event will feature in-depth sessions for A&E, Fire Alarm, Sprinkler and Special Hazards professionals, it includes a trade show, breakfast, lunch and afternoon snack along with extensive time to network with Vendors and fellow attendees.

Prospective speakers are encouraged to submit detailed proposals addressing, code and technical topics along with a brief Bio.

We are also going to open up Registration and Sponsorship opportunities shortly due to demand. It's your chance to either budget for 2020 funds or use up 2019 dollars!

Please submit presentations by Nov 1st to Jim Loftus @ James.Loftus@siemens.com

Company's Gaffes Delayed CA Crews in Oil Facility Fire

A locked gate, an inactive emergency fire suppression system and other issues held up firefighters battling a massive oil storage facility blaze in Crockett earlier this week.

MATTHIAS GAFNI OCTOBER 18, 2019

SAN FRANCISCO CHRONICLE



Firefighters battled a massive fire at Crockett, CA, oil storage facility that was ignited by an explosion that sent a giant fireball into the air.

KTVU-TV SCREEN SHOT

As firefighters descended on the [volatile blaze engulfing two giant tanks at a fuel-storage facility](#) in Crockett on Tuesday, they reached the front gate and found it locked.

And once they made it inside the facility with its 24 storage tanks, they discovered an abandoned operation: NuStar Energy's handful of workers fled the scene and the emergency fire suppression system was not activated, Contra Costa County Supervisor John Gioia told The Chronicle.

Gioia was briefed Thursday by officials, including the chief of the Contra Costa County Fire Protection District, which is leading the investigation.

- **[RELATED: CA Crews Battle Massive Oil Facility Fire Caused by Blast](#)**

Eventually, firefighters found a worker who was unable to inform firefighters about what type of material was stored inside the tanks, Gioia said. One of the tanks had exploded, going up in flames and burning another.

Gioia said the cascade of gaffes have left him troubled.

"What exactly was the training of these workers?" he asked. "It caused a delay. I don't think a long delay, but clearly seconds count."

NuStar issued a statement addressing how its workers handled Tuesday's fire.

"While all our employees are very familiar with the products in our tanks, the combustion happened so quickly and so unexpectedly, that there was some initial confusion about which tanks were impacted," officials said.

NuStar said its employees identified the affected tanks and understood the "product and the volume" of the contents, but it disputed the suggestion that staff abandoned the facility.

"Our employees are trained in an emergency to report to their muster point in order to account for and verify the safety of all visitors, employees and contractors," a NuStar spokeswoman said in an email. "In this case, the muster point is just outside the gate across the road. So while employees moved to a safe location away from the tanks, they did not abandon the facility."

Company officials also said the front gate was locked as part of a security plan required by the Maritime Transportation Security Act of 2002.

"Unfortunately, in this case, given the speed, intensity and particular location of this combustion, the suppression equipment for that part of the facility was inaccessible until first responders arrived to cool the area down with water," officials said.

Steve Hill, a spokesman for the Contra Costa County Fire Protection District, said the first fire crew to arrive was the Crockett-Carquinez Fire Department, which "encountered some difficulty getting into the facility."

Confusion over getting the gates open delayed entry by up to a minute, he said.

Earlier in the day, the company released a statement: "The cause of the incident is still being investigated, so we do not yet know if it is related to the earthquake or not," NuStar spokesman Chris Cho said.

[State officials have shuttered the Crockett facility until investigators can piece together](#) what caused an explosion and the destruction of two tanks containing 250,000 gallons of ethanol, leading to the seven-hour closure of one of the Bay Area's busiest freeways. Gioia and other officials Thursday had no information about whether a magnitude 4.5 earthquake that hit roughly 10 miles away in Pleasant Hill the night before caused the fire.

Gioia said search warrants were served on the company's computer servers, similar to an airplane's "black box," the morning after the fire. Those computers could include a video of the fire and explosion, as well as monitoring and measurement data before and after the fire, he said.

"The night of the fire the company lawyered up," Gioia said. "When they start lawyering up and they stop answering questions the night of the fire, you've got to get search warrants."

NuStar acknowledged that its own surveillance cameras captured the fire and the recording has been turned over to investigators.

Gioia wasn't sure exactly how firefighters eventually gained access to the NuStar property, but the plant was abandoned at that point. All but one employee bolted off the property, while the last employee ran the other direction toward Interstate 80. The supervisor said he was told that about five workers staff each shift and none hit the switch to activate the manual fire suppression system.

"I'm told they were pretty close to it on the way out and just passed it," Gioia said.

Once firefighters made contact with the workers, the trouble continued.

"The fire chief was clear that one of the fire personnel asked what was in the tanks and that (worker) didn't know," Gioia said.

Hill also said investigators are trying to determine why the fire suppression system was not activated. He said it's possible workers may have tried but it failed – or they were unable to access the controls due to the fire.

NuStar has said that following Monday's quake its employees had conducted a physical inspection, walking through the facility to look for problems and found none.

Fuel storage facilities like NuStar's are subject to fewer regulations than refineries, which process and also store fuel.

The Contra Costa County health department audits the NuStar facility once a year, but there's no requirement to check on a facility after an earthquake, according to county health officer Randy Sawyer. It's left up to the company.

Gioia said he hopes to add such tank farms – there are more than 30 in the Bay Area – to the Industrial Safety Ordinance, increasing regulations.

NuStar said Thursday that it [conducted air monitoring in multiple sites to test for contaminants](#) during the blaze, but none was found at detectable levels. Gioia, who serves on the California Air Resources Board, said that was because their ground monitors wouldn't pick up the smoke heading vertically into the air due to the lack of wind.

"The plume of smoke was particulate matter and it would have been very unhealthy to breathe that," he said. He added that hazardous materials investigators will be able to determine what emissions escaped based on the amount and type of materials that burned.

Shore Terminals LLC, the subsidiary of NuStar that runs the facility in Crockett, had five violations recorded by the Environmental Protection Agency from 2015 to 2017. One was related to hazardous waste requirements for large generators.

Shore Terminals LLC and the Crockett location were also involved in a federal criminal case in 2009 for emitting large amounts of volatile compounds into the air without a vapor recovery unit for at least a year, according to the EPA. The company pleaded guilty to making false statements and was sentenced to pay a \$1.75 million criminal fine, serve two years of probation and create an environmental compliance plan, according to the EPA.

The Crockett facility's most recent business plan was submitted to the county health department on Feb. 27. The plan said the site is a hazardous waste generator but doesn't treat waste on-site or own or operate underground storage tanks.

The documents said that, on average, the amount of fuel stored on a given day includes 21 million gallons of jet fuel, 10 million gallons of ethanol and 2 million gallons of gasoline.

The latest county health department inspection of the facility in July reported a minor violation of failing to test or inspect the structural integrity of each above-ground container. The county asked the facility to inspect, test and maintain records by a month later in August.

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NFPA issues Sprinkler Protection Guidance for Lithium-Ion Based Energy Storage Systems

In June NFPA issued an Industry collaborative document on the impact of protecting Lithium Storage systems with sprinklers. For those that are members of NFPA, the full 30 page report complete with fire testing can be found at

<https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Suppression/RFESSSprinklerProtection.pdf>

This report summaries much of the fire testing and sprinkler protection tests performed by FM Global at their test center.

The executive summary and introduction sections of the report are as follows:

Executive Summary

This summary report describes the results and fire protection recommendations developed through testing, small- to large-scale free burn tests on lithium-ion battery energy storage systems (ESS). Subsequent large-scale sprinklered tests were conducted to determine performance of water-based fire protection systems. All data, test descriptions, data analysis and figures in this report were graciously provided by FM Global. Exponent has relied on the FM Global testing report, “Development of Sprinkler Protection Guidance for Lithium Ion based Energy Storage Systems” [1] Further details are provided in the FM Global report. This project was conducted in conjunction with the Property Insurance Research Group (PIRG) and was directed through FPRF. This project is Phase II of a larger project with the goal to develop safe installation practices, fire protection guidance, and appropriate emergency response tactics for ESS. Phase I used literature review and full-scale free burn fire tests to create a fire hazard assessment of ESS in an effort to develop safe installation practices. All tests were performed on donated battery modules of two different chemistries; lithium iron phosphate (LFP) and nickel manganese cobalt oxide (NMC). The predominant difference in the hazard was the battery chemistry and energy density. The small-scale tests were conducted to determine if thermal runaway could be induced. Intermediate-scale testing was conducted to determine the effect of system capacity and thermal exposure. The large-scale tests involved two racks each with 16 modules. The tests were conducted to establish the overall hazard of the ESS. The full-scale sprinklered tests were used to determine the performance of a water-based fire protection system typically found in a commercial occupancy where an ESS could be installed.

Cont...

All tests showed ignition of a single module was sufficient to produce thermal runaway and allow for fire spread to all modules in a single rack. In all tests, the NMC modules presented a greater fire hazard than the LFP modules. Due to different battery chemistries and limited understanding of how other factors affect the fire hazard of an ESS, the results of these tests cannot be applied to ESS comprised of modules with a different battery chemistry.

Introduction

Lithium-ion batteries and ESS are becoming more common in the world. Unlike other common batteries and energy storage systems, the biggest hazard associated with lithium-ion batteries is the potential for thermal runaway. There have been multiple studies on battery characteristics and cause of thermal runaway of a single battery cell, but there is a lack of research on the subsequent propagation of thermal runaway in adjacent battery cells in a multiple cell module. [2,3]

The research detailed in this report is part of a multi-phase project conducted in conjunction with PIRG and in partnership with the FPRF. The overall project goal is to develop safe installation practices, fire protection guidance, and appropriate emergency response tactics for ESS. The first phase of the project completed in 2016, involved a literature review and gap analysis related to lithium-ion battery ESS and the development and implementation of full scale free burn fire testing of two 100 kWh ESS's. The literature review and fire test results were used to create a fire hazard assessment of ESS to develop safe installation practices. [4] The goal for this phase of the project was to determine the performance of water-based fire protection systems leading to the development of sprinkler protection guidance for lithium-ion battery ESS.

Separately, tests were conducted at the module level by DNV-GL to evaluate the performance of different fire suppressants such as water, wet chemical, and dry chemical. [5] The tests concluded that water was the most effective fire suppressant. These results were supported by the findings of large-scale testing by FM Global. [6] The recent studies provide confidence that sprinklers can be effective protecting ESS in commercial occupancies, but there is limited real scale data to support sprinkler protection guidance.

This project was directed by FPRF. All resources associated with conducting the tests, as well as compiling the data and results, were generously donated by FM Global. The Foundation expresses gratitude to NEC Energy Solutions, Inc. and Retrie Technologies for their donations

Meeting Dates/Programs 2019-2020

2019-2020 SFPE Program Schedule	Presenter	Date
Corrosion Management in Fire Sprinkler Systems	Lucas Kirn, PE of Engineered Corrosion Solutions	November 4, 2019
Latest Lessons Learned from Losses	Jerry Naylis, Technical Fire Services	December 2, 2019
No Meeting Scheduled		January 6, 2020
Cla-Val RE: Breach Valves	Bill Moore	February 3, 2020
Power over the Ethernet	Ernesto Vega Janica, IEEE	March 2, 2020
NJSFPE & AFAANJ Technical Seminar	Various Presenters	April 22, 2020
United Fire Protection Facility Tour on Special Hazards	Frank Savino, United Fire Protection	May 4, 2020
NJ-NY Metro Education Foundation Golf Outing	New York County Club	June 1, 2020
Fire Sprinkler Anti Freeze Protection	Amber Bodner, Johnson Controls Fire Protection	June 8, 2020
NFPA Conference & Expo	National Fire Protection Association	June 15-18, 2020



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Dave Gluckman

Fire Prevention Week Grant Program
David Gluckman

HELPFUL LINKS

ADAAG <http://www.access-board.gov/adaag/about/index.htm>

AFAA National <http://www.afaanet.org/>

AFFSA <http://www.firesprinkler.org/>

ANSI <http://web.ansi.org/>

ASHRAE <http://www.ashrae.org/>

Campus-Firewatch <http://www.campus-firewatch.com/>

Coffee Break Training <http://www.usfa.dhs.gov/nfa/coffee-break/>

CPSC <http://www.cpsc.gov/>

CSAA <http://www.csaaul.org/>

Municipal Codes (E Codes) <http://www.generalcode.com/Webcode2.html>

FDNY <http://nyc.gov/html/fdny/html/home2.shtml>

FM Global <http://www.fmglobal.com/>

FSDANY <http://www.fsdany.org/regs.htm>

FSI <http://www.firesprinklerinitiative.org/>

FSSA <http://www.fssa.net/>

Fire Tech Productions—Nicet Training (FTP) <http://www.firetech.com/>

Home Fire Spkrlr Coalition <http://www.homefiresprinkler.org/>

HVAC Bld. Control Fire Safety <http://www.iklimnet.com/hotelfires/hotelfiresmain.html>

AFAA-NJ <http://www.afaanj.org/>

International Code Council - <http://www.iccsafe.org/>

International Code Council Residential Sprinkler Exam - <http://www.iccsafe.org/news/>

[nr/2009/0709_ResidentialSprinklerExam.pdf](http://www.iccsafe.org/news/nr/2009/0709_ResidentialSprinklerExam.pdf)

The Joint Commission (JCAHO) - <http://www.jointcommission.org/>

www.JointCommission.org/

Material safety data Sheets (MSDS-OSHA Site) - <http://www.osha.gov/SLTC/hazardcommunications/index.html>

National of Fire Equipment Distributors (NAFED) - <http://www.nafed.org/index.cfm>