Workshop Proceedings:
Campaign for Fire Service Contamination Control

FINAL REPORT BY:

Peg Paul (Peg Paul & Associates);
Julie Reynolds (Peg Paul & Associates);
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Jeff Stull (International Personal Protection);
Robert Tutterow (Fire Industry Education Resource Organization)

Workshop held 19-20 July 2017 in Columbus Ohio

November 2017

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FOREWORD

There has been growing concern among the fire and life safety community that repeated exposures to contamination at the fire scene, combined with the subsequent post fire scene exposures to contaminated clothing, tools, apparatus, and stations are likely causing increased rates of cancer in fire fighters. Moreover, contamination has broader negative effects on health than just cancer. A number of other chronic health disorders could be related to broad, continuing chemical exposures. This problem has not been resolved and needs to be further addressed.

This workshop was held on 19-20 July 2017 in Columbus Ohio and was intended to address the fire service contamination issue and support the development of tools to properly perform contamination control in fire service. The broad contamination hazards that exist throughout the fire service have to be determined and gaps in how contamination is addressed today need to be identified. This workshop is in support of the larger project on “Campaign for Fire Service Contamination Control”, focused on the development and facilitation of an outreach educational campaign to control the spread of harmful fire ground contaminants, ultimately in support of improved fire fighter long-term health. Additional information on this workshop is available at www.nfpa.org/contamination.
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The Fire Protection Research Foundation expresses gratitude to the authors of these Proceedings (indicated alphabetically by last name): Peg Paul (Peg Paul & Associates); Julie Reynolds (Peg Paul & Associates); Marni Schmid (Fortunes Collide Marketing and Business Consulting); Jeff Stull (International Personal Protection); and Robert Tutterow (Fire Industry Education Resource Organization)

The Research Foundation appreciates the guidance provided by the Project Technical Panelists, the funding provided by the project sponsor (AFG), workshop participants, and all others that contributed to this research effort.

The content, opinions and conclusions contained in this report are solely those of the authors and do not necessarily represent the views of the Fire Protection Research Foundation, NFPA, Technical Panel or Sponsors. The Foundation makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

About the Fire Protection Research Foundation

The Fire Protection Research Foundation plans, manages, and communicates research on a broad range of fire safety issues in collaboration with scientists and laboratories around the world. The Foundation is an affiliate of NFPA.

About the National Fire Protection Association (NFPA)

Founded in 1896, NFPA is a global, nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission.

All NFPA codes and standards can be viewed online for free.

NFPA’s membership totals more than 55,000 individuals around the world.

Keywords: fire fighter, fire fighter cancer, chronic health disorder, contamination, contamination control, fire service, health risk, SOPs/SOGs, emergency service, equipment, PPE, NFPA 1, NFPA 1500, NFPA 1581, NFPA 1851, NFPA 1989, FPH

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Ken Brown, NVFC & VA State Firefighter’s Association
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PROJECT SPONSORS

AFG Fire Prevention & Safety Grant
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These are the proceedings of a workshop that was held July 19-20, 2017 in Columbus, Ohio. The workshop was intended to address the fire service contamination issue and support the development of tools to properly perform contamination control in fire service.

### CAMPAIGN FOR FIRE SERVICE CONTAMINATION CONTROL SYNOPSIS OF WORKSHOP AND FUTURE EFFORTS

Columbus, Ohio
July 19-20, 2017

A workshop was held in Columbus Ohio where 63 emergency responder, fire protection and research professionals met to assess proposed communication and awareness tools to be used in a Fire Service Contamination Control Campaign. The workshop was organized into different segments over afternoon and morning sessions to cover specific approaches for minimizing fire fighter exposure to a range of hazardous contaminants, known to create both acute and chronic health and safety issues. The agenda used in this workshop is shown below.

<table>
<thead>
<tr>
<th>Wed; 19/July</th>
<th>Time</th>
<th>Activity Description</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 pm</td>
<td>Day One: Welcome and Call to Order</td>
<td>Casey Grant, FPF</td>
<td></td>
</tr>
<tr>
<td>1:15 pm</td>
<td>Overview of fire service contamination issues and feedback</td>
<td>Jeff Stull, IPP</td>
<td></td>
</tr>
<tr>
<td>2:15 pm</td>
<td>Case Study: Equipment &amp; Facilities</td>
<td>Paul Erickson, LEWA</td>
<td></td>
</tr>
<tr>
<td>2:45 pm</td>
<td>PM Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:00 pm</td>
<td>Interactive/searchable research/literature database and feedback</td>
<td>Jeff Stull, IPP</td>
<td></td>
</tr>
<tr>
<td>4:00 pm</td>
<td>Standards resource database and feedback</td>
<td>Jeff Stull, IPP</td>
<td></td>
</tr>
<tr>
<td>5:00 pm</td>
<td>Adjourn for Day One (&amp; Evening Networking Reception)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thur; 20/July</th>
<th>Time</th>
<th>Activity Description</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 am</td>
<td>Day Two: Review of Day One activities – any additional feedback?</td>
<td>Casey Grant, FPF</td>
<td></td>
</tr>
<tr>
<td>8:15 am</td>
<td>Case Study: Standards Revisions</td>
<td>Dave Bernoway, CFD</td>
<td></td>
</tr>
<tr>
<td>9:45 am</td>
<td>Best practices database and feedback</td>
<td>Jeff Stull, IPP</td>
<td></td>
</tr>
<tr>
<td>9:45 am</td>
<td>Case Study: Best Practice Information</td>
<td>Beth Gallup, KFD</td>
<td></td>
</tr>
<tr>
<td>10:15 am</td>
<td>AM Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:30 am</td>
<td>Contamination Control practices in related industries and feedback</td>
<td>Jeff Stull, IPP</td>
<td></td>
</tr>
<tr>
<td>11:15 am</td>
<td>Outreach Plan Review</td>
<td>Peg Paul, PPA</td>
<td></td>
</tr>
<tr>
<td>11:45 am</td>
<td>Workshop Wrap-Up &amp; Summary Observations</td>
<td>Casey Grant, FPF</td>
<td></td>
</tr>
<tr>
<td>12:15 pm</td>
<td>Adjournment</td>
<td></td>
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Slides are separately available for each of the listed presentation areas.

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**Figure 1. a.: Workshop Summary Report**

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Proposed campaign tools included:

- A comprehensive, detailed White Paper, highlighting the extent of contamination control issues and best practices
- An Interactive, Searchable Literature Database on specific research articles and reports on contamination control
- A Standards Resource Database indicating requirements in existing and prospective standards related to contamination control and calendarizing important Public Input and Public Comment deadlines
- An updatable Best Practices Database that includes references for suggested multiple approaches that can be implemented at different levels within the fire service
- Related Industry Vignettes that highlight practices for controlling contamination in other industry applications featuring healthcare, nuclear power, and hazardous materials remediation
- A Question/Answer Forum for providing open industry communication on relevant contamination topics
- An agreed upon Glossary of Applicable Terminology

Each attendee was given an extensive questionnaire that was completed and turned in before the end of the workshop. Input was solicited related to how attendees would use the tools, what they expect the tools to provide, and how the final product could be improved based on what was presented during the workshop. Notes were taken to capture discussion and results are being compiled for the final report and recommendations. The Fire Protection Research Foundation expects to publish a detailed report that compiles the workshop findings by the end of August.

In addition, the project team is creating a detailed set of recommendations and action plan for implementing the different proposed contamination control communications and awareness tools based on attendee feedback and other new information. This report will be available at the end of September.
Some of the initial conclusions from the research team included the following:

- There is consensus that repeated exposures to contamination at the fire scene, combined with the subsequent post fire scene exposures to contaminated clothing, tools, apparatus, and stations are likely causing increased rates of cancer in fire fighters. Moreover, cancer diagnoses are happening earlier in a fire fighter’s life with unusual, rarer forms of cancers being diagnosed.

- There is consensus that contamination has broader negative effects on health than just cancer. A number of other chronic health disorders could be related to broad, continuing chemical exposures. There are also increasing concerns for biological exposures in the form of drug-resistant bacteria and various infectious diseases.

- The audience for this type of campaign should include fire fighters (both structural and wildland/forestry), fire officers, fire marshals, fire investigators, public safety officers, emergency medical technicians, others engaged in evolving fire service operations, as well as the fire and emergency services PPE, apparatus and equipment industry.

- The focus of contamination control has to extend beyond the fireground or emergency scene. Contamination should be removed from clothing, tools, and equipment before leaving the scene. Organizations need to take immediate action to prevent transport of contaminants and limit contaminants, at stations and other facilities, as well as contact with the public.

- The proposed tools should increase awareness across the entire fire and emergency services, including line fire fighters and members in leadership and support roles. These tools should also encourage the fire and emergency services PPE, apparatus, and equipment industry to responsibly respond with improved design, new technology products, and services.

- Any recommended best practices need to attain a minimum standard of contamination control. They should also include a variety of different approaches that allow implementation of changes in equipment and procedures that can be adopted by all fire and emergency services organizations (career, combination, and combination) based on their level of resources.

- The likely platform for disseminating these communications and awareness tools is a dedicated website; however, comprehensive approaches are needed to ensure that currently available information is made accessible and can be updated as increased research and findings are provided.

Figure 1. c.: Workshop Summary Report

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CONTAMINATION CONTROL CAMPAIGN

ABOUT THE PROJECT TEAM

Casey Grant and Alex Ing – Executive Director and Research Associate for the Fire Protection Research Foundation, an independent nonprofit whose mission is to plan, manage and communicate research in support of the NFPA mission

Jeffrey Stull – President of International Personnel Protection, Inc., a research and testing company specializing in personal protective equipment design, development, evaluation and standardization

Marni Schmid – Principal of Fortunes Collide Marketing and Business Consulting, LLC, a marketing and planning company associated with fire service safety and research projects

Peg Paul and Julie Reynolds – Director and Marketing Specialist for Peg Paul & Associates, a marketing communications agency that specializes in developing and implementing multi-integrated information and education campaigns

Robert Tutterow – President of Fire Industry Education Resource Organization (F.I.E.R.O.), an organization dedicated to promoting collaboration within the fire service for furthering health and safety awareness

THE GUEST SPEAKERS

Paul Erickson – Architect, LeMay Erickson Willcox Architects (Reston, Virginia), experienced fire station architect, developer and promoter of Hot Zone Design

Dave Bernzweig – Battalion Chief for the Columbus Fire Department, member of IAFF Local 67, and member of NFPA Technical Committee on Fire Department Occupational Safety and Health Program (i.e., NFPA 1500 series standards)

Beth Gallup – Captain, Kent (Washington) Fire Department, Washington State Council of Fire Fighters, contributor to “Healthy In, Healthy Out” (a publication funded by a grant from the State of Washington, Department of Labor and Industries, Safety Health Investment Project)

Figure 1. d.: Workshop Summary Report
The project group proposed the creation of a white paper as a central communications piece for the contamination control campaign. The white paper was conceived as a document that could be presented in multiple formats to reach different audiences and serve to define the issue of broad contamination hazards and the need for reducing exposure to contamination and controlling its spread in the fire service.

It was proposed that the white paper be written for fire service professionals with the principal objective for raising awareness of contamination issues in the fire service. Its anticipated length was indicated to range from eight to ten pages in length with key proposed topics including:

- Description of the broad contamination hazards that exist throughout the fire service (focusing on, and going beyond, cancer)
- Identification of gaps in how contamination is addressed today (acknowledging that not all missions, locations, and equipment are being addressed)
- Creation of drafts practices and comprehensive approaches to limit the exposure to and minimize the transfer of contamination

As presented at the workshop, the recommended elements of the white paper were:

- An overview of the contamination problem in the fire service
- The description of examples of contamination and the situations firefighters encounter that result in exposure
- Development of a baseline contamination control program with descriptions of best practices and known applications to include:
  - Tools to recognize contamination sources
  - Draft SOPs/SOGs describing protective measures including:
    - Isolating contaminated items
    - Implementing post-exposure cleaning and decontamination procedures
    - Maintaining hygiene of firefighters, apparatus, and stations
- Report on the state of research in contamination control
- Identification of current gaps in controlling contamination
- List of available resources
- Catalog of references

continued on next page
The expected utility of the proposed white paper to organizations was represented by way of:

- Improving awareness of contamination issues within the fire service (with the expectation that greater awareness will lead to the implementation of effective exposure prevention measures)
- Justifying proposed changes from a cost-benefit perspective
- Identifying industry needs (with the expectation that organizations can use this information to develop process, product, and service improvements that address these needs)

It was further proposed that the white paper be made accessible via

- Electronic PDF that can be saved/shared and printed on-demand
- PowerPoint Presentation
- Video or animation

A specific set of questions was devised to facilitate discussion from workshop attendees and encourage feedback during the open discussion as this topic was presented. Specific group recommendations and the responses to the questions are described below.

In general, attendees felt that white papers can be effective if the content is useful (contains actionable tools) and the paper widely distributed. The majority of the audience expressed their opinion that white papers are considered ineffective when they are written solely to impress other researchers.

Some clear recommendations are that the author makes sure the white paper:

- Is “readable” and is written in segments that firefighters and other targeted industry members can easily absorb.
- Includes a comprehensive index with key words, that is searchable and written in an organized way (using chapters and headings) that helps the reader find the content they’re looking for.
- Gives the reader enough information to answer their question; specific recommendations included using bullets and delivering the information in a FAQ or Q&A format.
- Is customized to different audiences. For instance, public officials want to know about budgeting, chief officers want to know what they can do to execute effective measures, Public Safety Officers need justification for getting wipes, extractors, etc.,

continued on next page
and researchers have a completely different set of needs. If the information is intended to justify a purchase (e.g. a second set of gear) then that section has to address those specific needs. It was specifically suggested that an executive summary be written for each audience.

- Includes recommendations with cost/benefit information with linkages to infection control. Examples of cost/benefit illustration opportunities include:
  - Compare the cost of installing a hygiene item with the cost of a member being diagnosed with cancer.
  - Use annual physicals as an example – the industry has made good progress with showing how conducting annual physicals saves the organization money in the long-term. Tie the cost of the item to reduced claim risk.
  - Ties best practice implementation to ISO and CFAI accreditation – at least identifies those departments that are leading the way.

- Includes an introductive summary that explains how the white paper is intended to be used and focuses less on which study/studies and more on how research results can be translated into action.

**General Feedback**

Feedback from the workshop attendees on included the following comments by area:

- Keep the white paper short (6-8 pages) and to-the-point
- Use images, visuals, and pictorials
- Concentrate on best practices that can be readily adopted, in small pieces, with easily digestible parts
- As opposed to academic “research” paper, a white paper could digest research into accessible bits. Research citations could be included at the end of the white paper for those readers who desire more in-depth, technical info
- Include enough information and detail to create understanding and kindle enthusiasm and spark action
- Target the different forms of the white paper to specific audiences
- Need to bring the information down to firefighter level – and have some general conclusions that fire departments can use
- Attach research
- Summary information is good, like an abstract in a research paper. But further evidence/links should be provided
- Know what the intended use is, include justifications
- Electronic version should have a menu (like a website) and links to different concepts/tools
- Hit the topics briefly with links to further explore
- Provide a broad overview of the issues

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WHITE PAPER

Presentation/Organization
• Organize it so it goes from concept/theory to practice
• Structure it as an executive summary of the website – have it directly lead to themes, headings, aspects of the website
• Organize it by how to implement solutions to a specific concern: go from the top down by who handles the situation in the organization; address factors that drive change (culture) and health & safety issues (identify acceptable exposure)
• Very nice breakdown step-by-step of topic: exposure likelihood - persistency - contamination types, FD missions, exposure locations, equipment, mitigation

Targeted Audiences
• Administrative
• Health & Safety Risk Management
• Operations
• Finance
• Groups outside the fire service (manufacturers, researchers, subject matter experts)

Content
• Advocates specific control measures to be provided for different types of contamination
• Ways to get a general idea of the research progress and what fire service can do

Updates
• Information should be updated regularly – a white paper that is never updated expires quickly

Cautions
• The majority of the fire service do not read research material
• Package it in a way that it can be used by firefighters
• Past white papers have often not been able to communicate key issues facing the fire service. Information overload can be an issue where the message gets lost

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Responses to Questionnaire

WP1: Does the white paper contain the appropriate level of detail?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>IDK</th>
<th>Why or why not?</th>
</tr>
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<tr>
<td>1</td>
<td>1</td>
<td></td>
<td>The concepts and topics appear to be good</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>Needs to be short, to the point, use pictorials</td>
</tr>
<tr>
<td>1</td>
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<td></td>
<td>6-8 pages should be good, may be too much for some fire service members</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>Specific control measures for types of contamination</td>
</tr>
<tr>
<td>1</td>
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<td></td>
<td>Enough info for the reader to understand the issue &amp; causes the reader to think</td>
</tr>
<tr>
<td>1</td>
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<td></td>
<td>I believe the level of detail proposed is appropriate but must be organized with the concept of knowledge to practice</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Outline seems to be useful. “Wait &amp; See”</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>Yes, but when followed and read by proper personnel. Should be information related and easy to follow for appropriate personnel</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>I believe this will cover with the appropriate level</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>If detailed (briefly) to specific audience</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>Unknown. Need to have a firefighter version and a whitepaper for the health &amp; safety officer</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td></td>
<td>There appears to be enough detail presented</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>Good as a quick summary but as stated below, need more credence below, attached research, links (?) (I had a hard time reading this word)</td>
</tr>
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<td></td>
<td>1</td>
<td>N/A</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>It’s an outline/baseline to get the conversation started.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>It’s not published yet</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>Only because I will be using it for enlightenment</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>As proposed, understanding contamination format provides practical information detail for stakeholders</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>Unsure. There is no whitepaper yet. Will a draft have review from – maybe a small sample of attendees or all attendees. Proposed content may be missing what is needed – help with intended use/justifications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>Perhaps whitepaper is structured like an executive summary of the website. Have the whitepaper directly lead to themes, headings, aspects of the website</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>Please concentrate on best practices that can be readily adopted, in small pieces, with easily digestible parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>Hopefully yes, it can’t be overly in detail BUT it has to have enough info and detail to illicit enthusiasm and change</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>They do depending on the person reading it. The majority of the fire service do not read research material</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>1</td>
<td>As opposed to academic “research” paper, a white paper could digest research into accessible bits. The research could be included at the end for those readers who desire more in-depth, technical info</td>
</tr>
</tbody>
</table>

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WP2: Do firefighters face contamination issues that carry broader risks than increased rates of cancer?

In summary, cancer is the greatest concern, other concerns include:

- Cardiac
- Respiratory
- Infectious disease
- Behavioral health
- Sleep deprivation
- Reproductive/endocrine and developmental effects
- Alzheimer’s
- Neurological

The one attendee who said, “No” added, “Other risks exist but incredible rates of cancer have to be the focus of the industry”

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Why or why not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Firefighters face issues related to cardiac, behavioral health, sleep deprivation, and many more</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Medical long &amp; short term exposures related to cerebral, cardiac, body organ (including skin). Not just one item to address, it is a broad range concern</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Sleep deprivation, cardiac, but I believe they all tie together to increase overall cancer risk</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Respiratory disease, skin infection, etc.</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Infectious agents, other chronic effects, possible acute effects - caustic chemicals, chemicals that target CNS, sensitizers, heavy metals - lead, take-home exposure - reproductive &amp; developmental effects</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Respiratory illness other chronic issues</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>MRSA, CDIFF, Radon</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Particulates may cause cardiovascular/medical issues, including asthma, bronchitis, etc. There are health issues besides cancer. Asphingent’s, irritants, allergens, etc are within smoke</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Infectious disease, contact dermatitis, from chemicals/plant toxins, COPD</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Cancer is more prevalent in FFs than thought. Deserves priority. Infectious disease exposure important as well</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>There’s more things out there than just cancer that are easily transmitted. Some we know about others that we need to find out what they are</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Yes, cardiac, and various medical conditions</td>
</tr>
</tbody>
</table>

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WHITE PAPER

Responses to Questionnaire (continued)

WP2: Do firefighters face contamination issues that carry broader risks than increased rates of cancer?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Why or why not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Biological, asbestos, etc.</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Endocrine problems, ID</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Many moving parts and they are all interrelated</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Decontamination from biological and other chemicals</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Various contamination issues, chemicals etc. exist in addition to cancer that are misunderstood, under researched or not known at all</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Primarily cancer but departments that perform fire-based EMS have communicable disease, infection control issues</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Nature of the job. Products of combustion. NO decon procedures in place now (or very limited)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>In addition to increased cancer risks, firefighters are also exposed to biohazards (contact with patients, illicit drugs, etc.)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Yes, but cancer is “considered” the life and death issue. All FF are exposed to smoke but not the other issues</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Other risks exist but incredible rates of cancer have to be the focus of the industry</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Exposed to so much that can cause chronic and acute non-infectious and infectious diseases</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Taking contaminants home &amp; spreading risk to family, spouses, children</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Disease, occupational and chronic, mental and physical – although the focus of this work is not mental health</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Alzheimer’s, COPD, MRSA</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>We cannot capture truly how broad contamination extends as it is ever changing</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Neurological issues, I haven’t seen much research but there is potential for more studies</td>
</tr>
</tbody>
</table>

continued on next page
### Responses to Questionnaire (continued)

**WP3: Was the information in the whitepaper, as presented in the summary, useful for you?**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Why or why not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Can’t answer without seeing the whitepaper</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>How to implement concern, top down and who handles in organization, what drives change (culture) health &amp; safety (acceptable exposure)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>I could get a general idea of the research progress and what fire services and IPP could do</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Reviewed important info related to contamination for firefighters</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Comprehensive approach!</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Very nice breakdown step-by-step of topic: exposure likelihood - persistency - contamination types, FD missions, exposure locations, equipment, mitigation</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>I like the menu (pick and choose) concept</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Yet to be determined (no whitepaper)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Me personally, yes, because I have a personal interest in it</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Yes, this should give a broad look at the issues</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Yes, I think hitting the topics briefly with links to further explore</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Will be useful - need to bring it down to firefighter level - and have some general conclusions that fire departments can use</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Provided a concise review of the important points</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Yes, summary is good, like an abstract in a research paper. But further evidence/links should be provided</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Yes - I’ve learned so much on this issue already</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Good background</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>I’m sure it will be</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>I think so but can’t tell w/o actual paper</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>All information now is useful</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>More than what exists</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Good info but the challenge will be to make it packaged in a way that can be used by ff</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Past “Whitepapers” have been able to communicate key issues facing the fire service. Information overload can be an issue where the message gets lost</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>The format that was explained seemed to be of a useful format</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>? Not sure what the content is at this point…</td>
</tr>
</tbody>
</table>

*continued on next page*
WP4: Will you be able to use that information to affect change in your organization?

Two follow-up questions were asked and attendee responses are summarized below and detailed in the table below.

**Why or why not?**

In general, attendees expect to use the information in the white paper to affect change because they expect it to include specific examples that compel them to shift their culture in ways that facilitate change and reduce exposures. Specific supporting comments included:

**If yes, how do you envision using the information?**

In summary, attendees anticipate using the information in the white paper to improve awareness of the issues (through education and training) and to justify incurring costs now to save money (and lives) later. Specific attendee comments included:

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Why or why not?</th>
<th>If yes, how do you envision using the information?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>The information compels us to make change and reduce exposures</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>You can if presented well – sometimes the message is valid but presenter not well received</td>
<td>Yes - data; theory (application-studies)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>We will keep pace with the research and raise the awareness of China Fire Service</td>
<td>We are currently implementing best practices for contamination control in our department, having a white paper with the evidence-based research to back it up would help to get buy in for change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NA. However, I think this has the potential to be very helpful</td>
<td>I will give an outreach of what US research have done at NFPA fire expo this year and hopefully fire services people will become more aware of the contamination issue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Already follow most protocols, give us more reasons to conduct research</td>
<td>Provide examples of best practices, where potential pitfalls are</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not unless you give specific examples</td>
<td>Model policy language?</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Define the base and explain why/how. I believe the paper will justify why change must be made</td>
<td>Distribution - market the paper - use as resource</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>If you give something a name it exists. If it exists it can be explained. If it can be explained it can be understood. If it can be understood it can be taught. If it can be taught it can become culture.</td>
<td>If you give something a name it exists. If it exists it can be explained. If it can be explained it can be understood. If it can be understood it can be taught. If it can be taught it can become culture.</td>
</tr>
</tbody>
</table>

*continued on next page*
**WHITE PAPER**

**Responses to Questionnaire (continued)**

WP4: Will you be able to use that information to affect change in your organization?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Why or why not?</th>
<th>If yes, how do you envision using the information?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>Will be useful in creating awareness &amp; initiate a breaking in FF culture. (Decon issues must become a priority in the eyes of frontline FFs)</td>
<td>Educate FFs, Fire Chiefs, and Elected Officials who approve budgetary consideration</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>This will help change policy</td>
<td>Changes as to how we respond to and deal with these exposures and the policies that help reduce exposures</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>To implement change broader audience may be needed that might not be provided on a white paper</td>
<td>To lobby for change/funding</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>My fire company is receptive to change and is looking for more ways to protect it’s ffs</td>
<td>I will use it to educate my department and do what I can to implement some changes to be more aware of contamination control and hazard issues</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Effect organizational change: target has to effect 3 levels: Government – Fire Admin – Firefighters. All have/need different approaches</td>
<td>(1) Government cost/benefit analysis, benefits of no idea; (2) FD Admin policy level and organizational awareness creating new culture; (3) FFs buy-in! Scare them / inform / mold them</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Don’t know. Budget, acceptance of hazard. It is a great place to start, a good catalyst for change</td>
<td>By raising awareness and fostering change</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>A white paper can serve as the basis for additional considerations as well as a tool to effect rule changes that are beneficial</td>
<td>This information can be disseminated via print, web-based resources and used to inform</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Not yet</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>But need more cost vs benefit discussed</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Unsure. While not working directly in industry, would now have resources for those we support</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>If it is packaged well</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>We must get solid data &amp; info to illicit discussion and changes needed</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>It is additional information that can be sent out</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>? Not sure</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>Hopefully with the information provided it will influence how we protect ourselves</td>
<td></td>
</tr>
</tbody>
</table>

*continued on next page*
WP5: What categories/resources/information could be included in the whitepaper to help you take action/affect change?

All written responses are recorded here. In general, attendees want visuals and specific action items that include time and financial requirements. Supporting comments included:

- Tell me what I need to know then, what do I need to do
- To touch - Coordinate within each agency/department (Administrative, Logistics, Finance, Risk Management - Health/Safety, Operations, Planning)
- Dermal decontamination data with timeframes, i.e. how soon to shower?
- Is it effective
- Contamination categories. Best practices for fire service (decontamination of personnel, equipment and apparatus...), diagrams and pictures
- Needs to be comprehensive
- Hot, cold, warm zones
- Mention more about Wildland fires
- Nano particle exposure
- Provide charts/graphs keywords
- Ask questions - answer
- Budget concerns
- Implementation strategies
- Definitive! Final determination: scientific/medical advice on sauna use
- You covered them well
- $ budgetary rationale
- Legislative rationale
- Standards
- Implementation strategies
- Operational guidance - samples
- Decision tree/matrix
- Hazard Control Zone Model for: on-scene, at training and demonstrative photos and graphics
- Emergency Scene
- Medical
- Fire
- HazMat
- Personal Protective Equipment
- Apparatus (trucks, engines, rescues)
- Stations (contamination control zones)
- What are the most prevalent/dangerous exposures / how can we reduce these exposures
- Case studies
- Statistics
- Digestible information to drive home message re: contamination
- Studies/proof of actions implemented and result
- Types of exposure
- Small or big changes that can be made and why
- * Easily identifiable best practices
- * Frequently asked questions with response
- * Needs to be easily disseminated * and understandable
- * Info easily searchable with keywords
- Cost/benefit analysis
- Personal stories (?)
- Policies/Procedures for contamination control / cancer awareness
- Case studies
- ABSTRACT, Conclusions, Summary
- Know your audience!
- Styles of decontamination processes
- Need realistic “best practices” which illustrate how the typical volunteer department can take action
- Almost all “best practices” are not in tune with volunteer departments that operate on a $30k annual budget
- N/A - not a fire department
- Everything presented, + summary of whitepaper and its intended use & audiences
- Explanation of the hazard
- Best practices
- Sample procedures
- Basic needs & changes at “troop” level
- Best practices
- Examples outlining ways to achieve implementation
- Bullet points outlining key deliverables or take aways from the white paper
- A program put out by the NFPA whether video or conference type format would be useful for small departments
- Large departments can use a representative or “SME” to put out w/reviews (???)
- More on the impact of leadership for effecting change
- Executive Summary = FF / Chief / City / Budget / Etc.
- Action items
- Q&A format
- Bullet points addressing “common” contaminants: diesel exhaust control – station vs fire scene; “soot” decon; vendor info
- Type of exposures / Benefits of decon / Ease of minimizing effects

continued on next page
WP6: Who do you think the principal audiences are for the white paper?

A tally of responses is included in the table below:

<table>
<thead>
<tr>
<th>Audience</th>
<th>Tally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firefighters</td>
<td>20</td>
</tr>
<tr>
<td>Company Officers</td>
<td>15</td>
</tr>
<tr>
<td>Admin</td>
<td>10</td>
</tr>
<tr>
<td>Family &amp; Public</td>
<td>5</td>
</tr>
<tr>
<td>EMS Personnel</td>
<td>5</td>
</tr>
<tr>
<td>IAFF - NVFS - FFs</td>
<td>5</td>
</tr>
<tr>
<td>Wildland FFS - WUI</td>
<td>5</td>
</tr>
<tr>
<td>Researchers</td>
<td>5</td>
</tr>
<tr>
<td>Political Leaders</td>
<td>5</td>
</tr>
<tr>
<td>Ops</td>
<td>5</td>
</tr>
<tr>
<td>ER Medical Personnel</td>
<td>5</td>
</tr>
<tr>
<td>Fire Investigators</td>
<td>5</td>
</tr>
<tr>
<td>Academics</td>
<td>5</td>
</tr>
<tr>
<td>Industrial Hygienists</td>
<td>5</td>
</tr>
</tbody>
</table>

Additional descriptors attendees used are:

- Health/Safety Officers, those that can affect policy and culture change in an organization
- Fire Services (in-line firefighters and fire chiefs)
- Rehab professionals (those who clean up after fires)
- Fire service members, namely chiefs; fire service researchers, health care providers who deliver care to fire service members
- Firefighters, officers, chiefs, governance board/commissioners/city council, Public? DOCTORS: annual physicals and when a firefighter gets diagnosed with disease process associated with firefighting/EMS activities. Will help with presumptive legislation
- Firefighters, Health & Safety committees, Risk Managers
- Fire Service Community: Fire Management, Supervisors, Workers; Municipal Government; Service Providers // Operational Support Functions
- Fire Administrators, FFs, Elected Officials, Family & Public
- Firefighter, EMS, police
- Policy makers / command staff
- Need to be specific audience
- Exec Officers, Fire Service, Safety Officer, and Training Officer
- Researchers, Academics, and, on a limited basis, the end user or stakeholder (First Responders)
- Leaders of departments
- Firefighters and their families, all emergency workers, public officials, influential community members; * different versions for different groups * (cost analysis compared to cancer LODD cost)
- Gov’t; FD Admin - Safety; IAFF - NVFS - FFs
**WHITE PAPER**

*Responses to Questionnaire (continued)*

**WP6: Who do you think the principal audiences are for the white paper?**

- Fire Service Leadership & Labor Orgs
  - The white paper should be written for different audiences & firefighters, stakeholders
- Firefighters & Executives
  - No one group. Need Executive Summary for the different groups
- Everyone: (1) Firefighters first; (2) Administration; (3) Public Officials; (4) Community
- Fire Fighting Industry & Supportive Organizations - anyone affected by Fire Fighting Industry; even prevention education can be consumed/shared by non-firefighters
- Fire service managers and cancer healer and safety fella
- The fire service from the ground to upper management possibly to city/county managers to argue costs
- End users, Researchers
- Fire Service Members and Administrators
- Firefighter -> Chiefs; City Budget People; Industrial Hygienists
- FF / Chief / City / Budget / Etc.
- Fire service - Command vs line service; regulators
- All members of the fire service - the more informed people are the easier it is for a cultural change

*continued on next page*
WHITE PAPER

Responses to Questionnaire (continued)

WP7: How do you expect to access the whitepaper?

A summary of the responses are shown in the chart. As you can see, Facebook and Twitter are the most commonly cited social media sites.

Please list specific media:

(Social Media) IAFC, IAFF, NFFF, etc. FCSN, NFPA; (Other) National Conference presentations, FRI, FDIC

(Social Media) Secret List; Challenge will be to drive people to the report. Maybe smaller sites. Younger people like video

All of the above - touch as many as possible

Create website; Create an app with all info. That is updated with relevant info

email PDF

Facebook

Facebook

Facebook, Instagram, Video (3-4 minutes, maybe several videos for specific areas

Facebook, Twitter

Facebook, Twitter

Facebook, Web source that is searchable

Facebook; PPT for Executive Level (mayors, council, chiefs)

Facebook/Twitter/via IAFF

FB

FB, Twitter, others used; OTHER: apps (as a resource - for instance a link to document in NFORS, etc.)

Twitter & LinkedIn

Video similar to AFD

WeChat, “Other” = electronical version
WHITE PAPER

Responses to Questionnaire (continued)

Recommendations

A white paper is a strongly suggested central document as part of a contamination control campaign. The white paper should be written in a manner to broadly address the contamination issues in the fire service for the purpose of raising awareness, but also provide information on acceptable best practices with solutions rather than simply identifying problems.

It is preferred that the white paper offer small easily understood pieces of information rather than convey any particular issue in detail, though references should be provided for whether to obtain additional information.

Whomever writes and manages the white paper, as part of the contamination control campaign, must be prepared to provide the paper in multiple formats, maintain links to resources, and make the white paper available on multiple platforms. These requirements suggest maintaining a website and multiple social media pages related to the contamination control campaign.

The white paper must be written so that it focuses separately on multiple audiences and provides each audience with enough information and solutions to address their needs and facilitate cultural change.
LITERATURE DATABASE

Concept

A large part of the project focused on the fact that a substantial amount of research had been performed and was ongoing relative to fire service contamination issues. This research in the form of literature represents the large bulk of information that is potentially available to the fire service and other interested parties. However, it was recognized early on that this literature including articles, reports, and other documents is spread over multiple sources and is not always easily accessed by those with specific interests. It was further recognized that the audience for this literature varies in their understanding of the different aspects related to contamination control, particularly in contrasting highly technical academic articles with broader lay firefighter summaries and general technical works.

During the project, a significant number of articles, reports, and various documents were identified and captured in a database (currently as an Excel spreadsheet) with specific information related to the identification, sourcing, and content of the different items. This literature database has been proposed as a major element in support of a contamination control campaign.

Workshop attendees were asked to comment on the proposed literature database – the proposal they were asked to evaluate would be populated using a variety of publications, including short articles, academic publications, and government and industry reports. These database items would come from multiple sources including general internet search results, existing general databases (like PubMed and Google Scholar), for-fee publications, and trade publications.

Attendees were shown examples of publications illustrating the variation in length, level of detail and complexity, and accessibility. Contrasts were made between academic articles, research project technical reports, online publications, fire service trade published articles, and short news articles.

The workshop discussion on the literature database included the types of database fields to be included and how to present abstracts or document content summaries, specifically whether or not they should be homogenized. Additional topics entailed how to organize the literature through a system of taxonomy, different ways for “tagging” or relating different literature items, and methods for maintaining the database.

continued on next page
LITERATURE DATABASE

Attendee Feedback

A number of specific questions were developed as part of a questionnaire on this campaign element to supplement the group discussion among workshop attendees. Attendee responses to the questionnaire are given below.

**LIT1: Have you previously conducted an online literature search related to contamination or other fire service safety and health issues?**

- Yes: 28
- No: 7

**LIT1: Which sources did you access?**

- Google Search
- Internet
- Google Scholar
- IAFF
- NIOSH
- NFPA Website
- University Research Tool
- Fire Service Publications
- Journal Publications
- PubMed
- FCSN

**LIT2: Were your previous searches effective/helpful?**

- Yes: 23
- No: 0
- Somewhat: 2
- N/A: 2
- Depends: 1

**LIT3: Do you think there is value in having an online literature and research database that focuses specifically on fire service contamination issues?**

- Yes: 35
- No: 1

continued on next page
LITERATURE DATABASE

Attendee Feedback

LIT4: Which groups of potential users do you think the literature and research database should be designed for?

- Users/Firefighters: 25
- Health & Safety Officers: 15
- Fire Service Leaders: 10
- Researchers: 7
- Physicians: 5
- Manufacturers: 5
- Admin: 5
- City/Town Leaders: 5
- Law Makers: 5
- Policy & Standards: 5
- Stakeholders: 5
- Union Officials: 5
- Budget/Planning: 5

Types of potential users having only one response included Academic, EMS/Police/Nurses, Industrial Hygienist, NFPA Committees, Risk Management, Public, Press, Scientists.

LIT5: Do you think the database should be limited to research papers and formal reports?

- Yes: 23
- No: 9

LIT5: What other types of publications should be included?

- Magazine Articles: 3.0
- Newspaper Articles: 2.5
- Evidence-Based Conclusions: 2.5
- Peer-Reviewed: 2.0
- Briefing Summaries: 2.0
- Fact Sheet: 2.0
- Government Agencies: 1.5
- Videos: 1.5
- Preliminary Studies/New Findings: 1.5
- Trade Journals: 1.5
- Testimonials/Forum: 1.5
- Flyer: 1.0
- PowerPoints: 1.0

continued on next page
LITERATURE DATABASE

Attendee Feedback

LIT6: What fields do you think need to be added to the database to make it useful to you?

- Key Words
- Publication Year
- Source or Publisher
- Abstract or Synopsis
- Category*
- Indication or Rating of Overall Relevance
- Important Parameters & Limitations
- Number of Times Cited
- Practical Implications

LIT7: If abstracts are written differently between publications, do you believe that an abbreviated version should be created for consistency among listed documents?

- Yes
- No
- IDK

*Or Categories Related to Contamination Control
LITERATURE DATABASE

Attendee Feedback

LIT8: Does the fact that some full articles may require purchase affect the usefulness of the database?

Some respondents added detail to their response and those details are included here:

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Please describe why or why not...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>Most people and organizations do not have the resources to buy. A good abstract will help inform the decision to buy or not.</td>
</tr>
<tr>
<td>1</td>
<td>24</td>
<td>Many people will not have access due to the cost.</td>
</tr>
<tr>
<td>1</td>
<td>23</td>
<td>Limits ability to obtain information.</td>
</tr>
<tr>
<td>1</td>
<td>22</td>
<td>Instills bias. Most will go for the free info, or what they can find.</td>
</tr>
<tr>
<td>1</td>
<td>21</td>
<td>Fire services or end users don’t have funding or budget for that.</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>Would be great if full versions are available. If not, provide as much detail as possible. See FSTAR - summarizes research.</td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>Not everyone will look @ all documents if they have to pay to read.</td>
</tr>
<tr>
<td>1</td>
<td>18</td>
<td>There is normally a summary of the article. If researchers need/want the full version they can pay if the article is important to them.</td>
</tr>
<tr>
<td>1</td>
<td>17</td>
<td>As long as the work is described and its relevance is communicated I can make an informed decision or purchase for me weeds.</td>
</tr>
<tr>
<td>1</td>
<td>16</td>
<td>Cost is always a barrier.</td>
</tr>
<tr>
<td>1</td>
<td>15</td>
<td>Provide the path to the article and then the user can decide if they want to pay to view a certain article if necessary.</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
<td>However, the abstract or summary should provide enough free info so the user can make an educated decision on whether to purchase the full article.</td>
</tr>
<tr>
<td>1</td>
<td>13</td>
<td>What’s the cost, who pays the fee?</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>It takes time to get the articles that have to be purchased. When consulting a lit review very rarely spend $ for articles.</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>If clear they require purchase, it is ok.</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td>Free information will be viewed by more people.</td>
</tr>
<tr>
<td>1</td>
<td>9</td>
<td>Most F.D.’s would not allow the researcher to pay for the info on a regular basis.</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>Any barriers to information affect the usefulness.</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>Will discourage.</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td>It could deter people from using it.</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>Not all research is performed (?) by academic/research; sometimes FFs and FDJO (?) try to purchase studies research and do not have budget.</td>
</tr>
</tbody>
</table>

continued on next page
LITERATURE DATABASE

Attendee Feedback

LIT8: Does the fact that some full articles may require purchase affect the usefulness of the database?

Some respondents added detail to their response and those details are included here:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Please describe why or why not...</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Without purchase not all points of view would be viewed by the majority</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>People less inclined to pay for information</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Users have the choice to use that resource or not</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>We can't all afford the costs for some sources</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Need free access!</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Can be limiting due to FF size or group</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Most will move on and find a free source</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Could limit the effectiveness of the database</td>
</tr>
</tbody>
</table>

LIT9: Should the database have a feature that allows people to contribute to the database or recommend documents to add to the database?

A few people added that contributions need to be vetted and controlled.
### Attendee Feedback

#### LIT10: Is the tutorial on conducting a search helpful?

Some respondents answered the follow up question and their responses are below:

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Why or why not? What would make it more helpful?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Teach people how to do simple searches may be able to adapt from some other site</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Can be - depending on who is doing the research</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>More concise for the end users to find what they need</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Even grad students or established researchers can struggle with lit reviews or at least miss important references</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Not all of us are scientists/researchers, need to be able to pull specific information for different needs</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Researchers or those familiar with writing already know how to research. There is a concern that firefighters may misinterpret study or info, that is why FF should have summary only</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Critical if we are to advance our work, develop leads, support grant applications, people (practitioners, firefighters) need to be able to use it</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Important to be transparent about research based on data, evidence vs opinion</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Yes, any info on how to better reach your goal is useful</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>The easier to navigate the more helpful it will be</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Best practice approach blown through the user community</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>It would be, but keeping the search feature simple would not make this necessary</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>A tutorial will make a search easier &amp; prevent frustration</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Won't hurt but not a priority</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>A brief tutorial may help those who are not well versed in research in allowing them access to needed information</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Didn’t see one but think it would be helpful</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Yes, if lay persons who have access</td>
</tr>
</tbody>
</table>

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*continued on next page*
LITERATURE DATABASE

Attendee Feedback

LIT11: Should a tutorial be available on the campaign website?

- Yes: 29
- No: 2

LIT11: Preferred method of delivery

- Video: 20
- Text (Step-by-Step Instructions): 15
- Illustration: 10
- Other: 2

1 Other ("Video/Camtasia for example; Other = PPT")

continued on next page
LITERATURE DATABASE

Recommendations

Based on attendee feedback, it is important that the contamination control campaign toolkit has a literature database that focuses on fire service contamination issues. There are many potential users of the database but the key target users were identified as firefighters, Health & Safety Officers, and fire service leaders. The database should be structured to service these users but also include information that may be of interest to other end users that include academic groups, manufacturers, and other industry interests.

The literature database should not be limited to research papers and formal reports – it should also include magazine articles, evidence-based conclusions, newspaper articles, and peer-reviewed pieces.

Specific recommendations for information fields that should be included in the database include key words, the full title, the publication year, notes on significant findings, an abstract or synopsis, a link for obtaining the publication, the source or publisher, the contamination control-related category or categories, the names of all authors, the full citation, and an indication or rating of the overall relevance.

The database should include abstracts that are standardized for the database instead of simply copying the existing abstract, particularly for academic articles.

The potential cost of obtaining the full publication cited in the database must be a consideration for whomever creates and maintains the database. Licensing/copyright availability should be pursued so that the articles can be available to the fire service at no additional cost, if possible.

There should be a mechanism for end users to suggest or add articles and comment on what they see in the database and this type of database feedback should be monitored and vetted.

Users would appreciate a tutorial on how to use the database and how to effectively conduct a literature search. This tutorial should be provided in multiple formats including video, text/written step-by-step instructions, illustrations, and a PowerPoint presentation file to account for the various methods that people use to learn how to complete tasks.
STANDARDS RESOURCE DATABASE

Concept

Standards that establish requirements or guidelines for contamination control practices are considered one means for for instituting change in the fire service. One area of investigation in the project included an assessment of different NFPA and other standards and how these standards already do and may address contamination control. Not unsurprisingly, few of 94 NFPA standards that could potentially affect firefighter contamination issues actually included any specific language or criteria for contamination control. These standards included those addressing fire service occupational safety and health, personnel qualifications, training, equipment (personal protective equipment, fire tools, and hose), fire apparatus and standards related to selection, care, and maintenance of equipment. A review of standards from other organizations such as Federal regulations from the EPA and voluntary consensus standards from ASTM International and the American Association of Textile Chemists and Colorists (AATCC) also did not uncover any requirements specific to fire service contamination control.

In response to these findings, the project research team recommended that a database linked to standards be established to create awareness for current criteria in standards that can be related to contamination control and offer the potential for identifying opportunities for future changes to establish either mandatory practices or recommended guidelines on the broad range of contamination control. This suggested effort was considered to be a principal element for a proposed contamination control campaign.

For the purpose of illustrating the concept of a standards database, a preliminary database was developed. The proposed standards resource database contains the designation of the standard, the title, a description of the relevance to contamination control, a list of specific, applicable sections, information about the revision cycle, and a criticality rating.

There was a discussion in the workshop for the utility of standards as they relate to implementing or improving contamination control best practices, promoting overall contamination awareness (competency and training standard), and improving equipment and care procedures.

The group also discussed the need for, and ways to encourage, participation in the standards revision process including the fact that researchers should take advantage of opportunities to conduct studies to validate new requirements as part of their research projects that address contamination control.

The need for coordination among standards bodies and the different individual committees was discussed. One suggestion was made to form a new group under the NFPA committee process with oversight responsibility to address issues related to contamination across multiple standards. Other parts of the discussion debated whether standards should provide mandatory requirements versus guidelines with a mixed set of opinions for the specific role of standards.

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STANDARDS RESOURCE DATABASE

Attendee Feedback

A segment questionnaire combined with a group discussion were used for obtaining feedback from the workshop attendees. Specific responses to the survey are provided below.

**ST1: Do you think having a standards resource database is a useful element of the contamination control campaign?**

One person added a comment that it should be validated.

**ST2: Do you think that standards are an appropriate means to address contamination control issues and solutions?**

3 attendees made qualifying statements including:

- “to some extent”
- “but currently limited”
- “but legislation is always desirable”

**ST3: Should the standards resource database be limited to NFPA standards?**

- One respondent listed NFPA, NIOSH, UL, EPA
- A different respondent commented that there might be copyright issues
- Another respondent said the standards database should be limited to NFPA initially

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STANDARDS RESOURCE DATABASE

Attendee Feedback (continued)

**ST4:** Since many standards can be created or revised to address contamination control, what criteria should be in place for identifying a standard as relevant? Responses from this question are in the table below.

| Many fire departments need the authority and minimum requirements of an NFPA standard. OSHA rules would also be another avenue |
| 93 standards overlap on contaminants, each standard should identify its effect on one another - major undertaking needs to be done - as relevant - great questions - effects on user - intent |
| Determined as having sufficient peer-reviewed data; as determined by a committee, to be accepted as relevant |
| The standard should include contamination control article or chapter |
| Does it apply or could it apply to the firefighting environment |
| Peer-reviewed validated through multiple sources |
| Product testing |
| Actually addressing what should be done and how it is done |
| Review taxonomy in standards |
| Consider looking at a new standard (Industrial Hygiene/Rehab/Infection Control OR Rehab/Infection Control/ HazMat 472) |
| Consistent with known best practices basis of evidence based data informed results peer reviewed & qualified |
| Must be relevant to the contamination of a fire fighter. If he/she can be contaminated by having contact with the item or process it would be considered relevant. |
| Fire service participation |
| Public comments accepted |
| Peer reviewed |
| Submitted to group of experts for approval |
| This is one of the most important pieces to determine. I think there needs to be a balance of vetted information standardized info, and opinion & experience, case studies, etc. |
| Meets or exceeds a consensus baseline |
| Try to look at the most current and relevant as possible |
| Contamination is a part of every aspect of the fire service. I believe every fire service standard has an opportunity to include at least minimal information on contamination control. |
| Would be useful to have access to foreign standards (ie EN) |
| SOP repository would be helpful |
| There should be teeth in it to be relevant |
| Research process |
| If it addresses firefighter health and safety, some element of station or apparatus design/use, and PC&E specifications and use |

*continued on next page*
ST5: Should a strategy be developed to ensure coordination and consistency among specific criteria included in standards addressing contamination control?

ST6: Are some types of standards more relevant than others for addressing contamination control?

ST7: What level of detail should be used to describe the potential or relevance of a given standard on contamination control?

Start out small & general with a lot of annex information

There could or should be levels or categories that address the levels of detail. I.E. highly detailed - summary or executive summary, highlight or notes

Effect on user - what effect

The detail should be applicable for fire service and manufacturer

High level of detail

Actually addressing what should be done and how it is done

Insert descriptive appendix material and/or refer to correlating committee and/or new standard and reference in existing standard needing reference

Executive summary as well as more detailed report and associated data

Minimal detail is necessary - related to firefighter contamination = relevant

I think you should be able to search for very specific keywords or phrases but also search for more broad concepts

Varies by intended audience

Should be very

At the very least minimum standard

This should be left to the standards committees. Awareness can be provided to trigger a committee to consider contamination in future work.

Needs to be definitive but also able to be adjusted due to service system

I would not get too deep in the weeds, use enough detail to get the intention relayed, do not make it a dreaded read

Not sure

continued on next page
STANDARDS RESOURCE DATABASE

Attendee Feedback (continued)

ST8: Should the standards resource database be a conduit for promoting public input and comments on existing standards?

- One respondent who said it should be a conduit added, “But it should be monitored and comments should be able to be blocked/removed”
- One of the respondents who said it should not be a conduit added, “Use current standard setting process”

ST9: Which NFPA standards, if any, do you think are affected by/should be tracked by this campaign to provide input/comment?

Comments:
What about CPSE Accreditation as a vehicle? Maybe cannot impose requirements but could at least force department to have a plan
All that affect contaminants 93 of them
1971 - 2018 edition will include particulate and liquid penetration
How Clean is Clean...
1001 (1) how to clean and inspect as a section; (2) officer standard also
1901, Station Design, PPE, Equipment, Infection Control, Rehabilitation, 1500 (Mom & Apple Pie)
1500 - it starts and ends there
This should be determined by standards committees with awareness guidance to make contamination control a consideration of ongoing work.
1851/1852 / All SCAM Docs; 1500, 1584 / All safety standards; Apparatus, PPE, Equipment standards that do not have a SCAM should be addressed by a contamination control doc under the occ safety health committee
Can’t read last one - 158x?
1500-series

continued on next page
STANDARDS RESOURCE DATABASE

Attendee Feedback (continued)

**ST11: Which contamination control topics/tools/requirements do you expect to be included in NFPA standards?**


1971

All available

All of it - create a new standard for all of the others to refer to / update 1581 to match

Apparatus & equipment

Cleaning and decon

Decontamination procedures

Educational component

Fire apparatus

Fire apparatus design

Fire stations

Gross decon

Hot/cold decon, maintenance, durability

Operations

PPE

PPE

PPE (both fire & medical)

PPE/SCBA/Tools/Hose

Prevention, mitigation, control, decon

Process, timeframes, and responsibility

Proper decon procedures, health & safety program elements, PC&E use

SCBA cleaning

Station and equipment design

Station design

Station design, decontamination equipment / procedure personnel vs. equip decon & facilities

Station Practices

Stations

Testing & requirements

Testing methods & styles

Training Practices

ST11: Which contamination control topics/tools/requirements/themes do you expect to be standardized across NFPA standards?

All available

All of it - create a new standard for all of the others to refer to / update 1581 to match

All, but the parent doc should be a specific contamination control document

Apparatus & equipment

Cleaning products

Common Terminology

Decon

Decontamination procedures

Dermal decon

Documenting exposures

Educational component

Equipment storage & transport

Facilities

Gross/on-scene

Limits contamination

Personnel & equipment decon procedure

PPE (both fire & medical)

Prior to eating/drinking

Procedures

Process and timeframe

Proper decon procedures, health & safety program elements, PC&E use

Stations

Terminology

The idea of hot/cold or contam/ non-contam zones and contam control & decon

Transportation from incident (tools, PPE)

What should a firefighter know / What should firefighter do

When to clean with guidance

continued on next page
STANDARDS RESOURCE DATABASE

Attendee Feedback (continued)

ST12: What format would be most useful for you to interact with the standards?

- Online Calendar with PI and PC Due Dates
- Standards Listed by Number with PI and PC Due Dates Listed
- Calendar List with PI and PC Due Dates
- Action Alerts
- Online Standards Database

- One attendee commented, “Ability to sign up for alerts to take action”
- One attendee commented, “Search engine”

ST13: How do you or would you use the standards to drive Standard Operating Procedures (SOPs)/Standard Operating Guidelines (SOGs)?

| Good SOPs & SOGs are based on standards if there are any | Standard review/adoption is built in to development of most SOPs |
| Standards will be used as a resource to develop SOPs | I would use them to inform change/support needed change in my department & community departments |
| Limitations and expectations | Bring SOPs into compliance |
| Make standard in our department! | To use a reference in developing SOPs |
| Develop SOPs/SOGs referring to related standards as a minimum requirement | Standards are FD reference documents for providing the blueprint to which you can develop your SOP |
| Standards can help justify additional costs | Min requirements |
| Model policy in Appendix | As a guideline |
| Would use the standards to drive SOPs/SOGs | Every good SOP/SOG needs to be tied to a best practice or standard |
| I’d suggest providing sample SOP/SOGs and use them to drive the standards | Not sure |
| Research & development of best practices & training | |
| SOPs/SOGs would be more relevant if backed by an NFPA standard that already includes supporting research/documentation | |

continued on next page
ST14: How can the standards (or the standards revision process) be adapted to increase your engagement with the standards/process and make them more useful for your organization?

The process is open but too dragged out
The process is complex to the non-standard development person. Course work on programs that explain the process would be helpful
Educational component
Open to all stakeholders no matter whether end user is a member of NFPA
Should be able to ID areas for consideration for new editions and provide comments to proposed revisions
Notifications ahead of time
Model policy for ease of adaption
Currently works fine
Provide examples/options/visuals on how the practitioner can adopt/adapt and use
Availability

They need to be easier to locate & understand. Best practice tips of how to implement would be really helpful.
Easy to access and understand
Where do I start? First would be to make the process easier to understand by the end users and not worry so much about what is best for NFPA. Next, catch up to technology and communicate with end users so they become interested.
1st / 2nd draft need to be easier to access the proposed changes along the way
Add a checklist to each standard similar to the 1500 audit
Not needed. Can submit comments now. Process is ok now

ST15: Is a tutorial on inputs/comments helpful?

Why or why not? What would make it more helpful?

TWhat can I do to have an impact on the process
Even committee members have a difficult time explaining the process. Handouts and informational sheets would be helpful.

Knowledge
Easier for stakeholders or end users to target what they need
Don’t know how to do this unless you’ve already done it
It is currently explained on NFPA site
Greater awareness & accessibility
Gives NFPA a chance to set the expectation for what sorts of comments will not be tolerated
Should be straightforward, self-evident won’t hurt
Absolutely, a tutorial that is simple, uses normal terminology and illustrates the process at a true firefighter level not the typical NFPA level which doesn’t provide any information easy to find
Those who don’t participate in the process find it very complicated
It will help comments stay focused
It will help you to best use the system

continued on next page
STANDARDS RESOURCE DATABASE

Attendee Feedback (continued)

ST16: Should a tutorial be available on the campaign website?

- Video
- Text (Step-by-Step Instructions)
- Illustration

Yes: 20
No: 2

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STANDARDS RESOURCE DATABASE

Recommendations

There was overall agreement for having a standards database. The large majority of respondents felt that standards have utility and represent a useful means for both creating awareness in the fire service and establishing appropriate practices to address contamination control. Coordination among standards development efforts are needed to provide a consistent and clear sets of approaches on this topic.

In order to improve engagement and participation in the standards-editing process, the standards resource database should include a calendar view showing the due dates for public inputs and public comments for the affected standards. The calendar would have to be adapted for the revision cycles of outside standards if non-NFPA standards are included. Additional information in the standards database should highlight specific relevant portions of the respective standard to allow end users to determine the adequacy of current language and make decisions on whether changes are needed.

An overall strategy should be defined to implement changes to the affected standards. This strategy should include how specific oversight and coordination can be undertaken in addition to identifying way to support new requirements or guidelines through coupling standards with existing or emerging research.

The standards revision process is complicated and should be simplified. A user friendly tutorial should be developed and made available to the fire service to encourage their participation in the affecting standards.
One of the more highly touted elements of the contamination control campaign by the project team was a listing or database of best practices. The compilation and verification of best practices is seen as way of providing definitive guidance to the fire service for performing specific actions that achieve contamination control. In reviewing an approach for putting together a best practices database, current examples of recommended actions were reviewed including those from the Firefighter Cancer Support Network, IAFF, IAFC, NVFC, and Washington State Council of Fire Fighters.

Specific categories of best practices relative to contamination control were proposed and included:

- Avoiding contamination
- Wearing PPE
- On-scene gross decontamination
- Handling and transporting contaminated items
- Cleaning and decontaminating contaminated items
- Personal hygiene
- Health and wellness
- Documentation and recordkeeping
- Designing and cleaning apparatus
- Designing and cleaning station facilities

A number of example best practices were detailed in discussing each category.

The group also discussed considerations for qualifying an activity or approach as a best practice and how to synthesize best practices into department operations including using Standard Operating Procedures (SOPs) and Standard Operating Guides (SOGs).
BEST PRACTICES DATABASE

Attendee Feedback

A prepared segment questionnaire was used to help guide workshop discussion and provide a basis for obtaining specific feedback in areas related to the proposed best practices database. The attendee responses and feedback during the workshop are detailed here.

BP1: Should a purpose of the campaign be to consolidate a comprehensive list of best practices or simply reference existing guidelines?

• The most popular response to this question was to consolidate a comprehensive list of best practices.
• A few attendees added that levels should be created so that departments have best practices they can implement that suit their operation.

<table>
<thead>
<tr>
<th>Yes - best practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>A list of best practices for quick and easy reference</td>
</tr>
<tr>
<td>A comprehensive list is preferable</td>
</tr>
<tr>
<td>Best practices</td>
</tr>
<tr>
<td>Model policies</td>
</tr>
<tr>
<td>Consolidate a comprehensive list of best practices</td>
</tr>
<tr>
<td>A list of best practices would be more readily available and easier to follow</td>
</tr>
<tr>
<td>List of best practices</td>
</tr>
<tr>
<td>Combinations of both - depending on type of incident</td>
</tr>
<tr>
<td>Should be both</td>
</tr>
<tr>
<td>Best practices</td>
</tr>
<tr>
<td>Yes - concentrate on info sharing – use someone else’s SOPs - make sharing possible</td>
</tr>
<tr>
<td>Consolidate list of best practices and create the foundation to keep them updated</td>
</tr>
<tr>
<td>Comprehensive list of best practices</td>
</tr>
<tr>
<td>Consolidate comprehensive list</td>
</tr>
</tbody>
</table>

I think a reference list broken down by discipline/issues so members can see what is being done across country maybe “Gold”, “Silver”, “Bronze” level so of practices

Best practices

Best practices should be stressed as example only. Should be categorized so volunteer departments with little funding have options.

Refer to existing guideline ultimately choice resides at AHS

List best practices

Best practices is a great resource

Consolidate a comprehensive list of best practices

I think a list of best practices organized by topic area

Do both because you give people options (better than nothing) and guidelines give people a way to do things or prompt ideas they hadn’t thought of or that can be improved

Yes

Yes - this gives the best chance of compliance/voluntary adoption of guidelines

continued on next page
BP2: Which features make best practices useful to you/your organization?

- Items which are going to make best changes
- Hosing off adding a brush and a detergent to help in gross decon
- Low cost
- Can be phased in
- Not written in “standards language”
- Clearly articulated in plain language
- The challenge in Florida is major metro vs rural. So, recommended guidelines with level A, B, or C, or level 1, 2, 3 for a “Tool box” approach for small, medium, and large agencies
- Simple to operate, low cost and less manpower
- Model programs
- Modules that can be selected and used by the department
- Ability to implement
- Utilizing existing principles/practices
- Cost analysis
- Evidence
- Ability to freely use material
- The ability to adapt to a large or small department
- Statistics that show need for change
- Glossary of terms
- Ways to implement
- Reference guide to complete standard

They are clear examples of what should be done and can be written in to department SOPs
Provides a succinct easily accessible reference that can keep members safe
Policies & procedures for gross decon, fire station operation, preventive measures to reduce exposure
Implementation in parts or as financially available
Best practices should be proven/validated as effective
Easy to follow
All info in one place
Fact sheets / posters would be useful as well
A simple list of steps you can take to remove contaminants from your PPE
Every agency need guidelines - SOP SOGs - standards on policy for direction - they always take least level
They need to be realistic & practical
Step by step illustrative instructions
Tried by multiple organizations and proven
Ideas from other department or organization
Clear, easy to understand an example for how to implement
Demonstrated effectiveness of a particular intervention
Implementation plan

continued on next page
BP3: What tools did you see today that will support you in your efforts to address fire ground contamination issues?

- All of them, we must drive change and all will assist in this
- Kent’s use of warm water from truck combined with brush and detergent
- Referencing best practices, recommendation 2 (from PowerPoint) (may be referring to Healthy In, Healthy Out)
- Columbus exposure report instrument
- Various methods and options such as wet-vs-dry gross decon
- Training videos booklets
- Are there any existing industry journals that could be made available for review of practices and ideas
- All of it is applicable and will all be utilized in one form or another
- Hot, Warm & Cold Zones to address contamination not only in HazMat situations but on structure fire and in stations as well
- Gross decon
- On-scene cleaning
- Ideas on US:NL new language to reflect the immediate dangers of fire ground
- On-scene decon followed by gear cleaning
- To have standards that address issues with validation
- The different existing best practices/studies and current ideology
- Other fire department SOPs
- On-scene/gross decon
- Best practice information from presentation
- The ability to learn from other departments’ success stories
- NFPA for updates

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BEST PRACTICES DATABASE

Attendee Feedback (continued)

BP4: What additional tools do you need to support you in your efforts to address fire ground contamination issues?

- Studies showing the effectiveness of certain procedures
- Better communication with volunteer issues
- Low tech options
- Access to studies/data
- More info on best practices for apparatus
- Inexpensive and basic techniques, up to more advanced approaches
- Detailed practical procedures to carry out the best practices
- Best practice
- SOP - SOG
- Website
- Easily presentable best practice methods
- Easy access to relevant information/database in one location
- Model policies and developed training programs
- Buy-in from membership (old timers)
- More research on APR filters & CBRN filters
- How to clean hose
- More access to educational materials - PowerPoints, fact sheets, etc.
- To have standards that address issues with validation
- More supportive evidence to back up best practices - will help to sell to end users
- Continued evaluation of new processes
- SOPs would help - videos will get people's interest as well
- Unsure at this time
- Funding streams

BP5: Should the best practices database include sample standard operating procedures (SOP) from existing fire departments or other organizations?

- Yes: 26
- No: 0

BP6: Should the best practices database include reviews of new technologies or equipment related to contamination control?

- Yes: 24
- No: 2

One attendee who responded “Yes” added the comment: “Pros/Cons; what we know/don’t know”
BP7: What criteria should be applied for determining appropriate best practices to be cited?

Comments:

- Can it work for the masses and be implemented easily and quickly
- Solid data peer review
- Peer reviewed evidence based
- Based on data and success stories and science and/or medical research outcomes
- Peer review
- Could have an SME panel that provides pros/cons limitations for best practices. Could look at existing panels
- Evidence-based
- Precautionary principle
- Data/Science supported
- Proven effectiveness
- Best practices should be tried and tested
- Science-based information should be easy - non-science-based information should be vetted by subject matter experts
- Scientific data review

- Proven effective - validated
- The practices that are vetted to reduce contamination should be used. However, the idea that something is better than nothing is also useful. No unvetted practice that could potentially expose you further if determined it doesn’t work should be used.
- Validated testing and standards
- There are other forums more appropriate for selling products. New ideas yes, products no
- This is always a tough one to tackle! Committee of industry professionals (SMEs) to vet them. Should generally avoid conflicts of interest, potential for profit equipment etc.
- No advertisements for products. Info from fire departments or organization
- Demonstrated effectiveness by statistically significant contaminant exposure reduction
- Peer review
- Consensus standards
- Scientifically validated

continued on next page
BP8: If conflicts exist between practices, what process should be used to make the appropriate choice? Should a choice be made?

Some attendees seemed confused by the question but most made suggestions that provide some direction for dealing with conflict between practices.

<table>
<thead>
<tr>
<th>Choice should be left to user</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence based where possible</td>
<td>A best practice should be identified-variations can be the choice of the FD</td>
</tr>
<tr>
<td>I would respond that multiple approaches with the merits and expenses (cost-benefit) should all be included</td>
<td>Affordability is an issue and that leads back to something is better than nothing</td>
</tr>
<tr>
<td>Consensus</td>
<td>Apply the best practice possible based on conditions and/or limitations of the department</td>
</tr>
<tr>
<td>A choice should be made according to different situations and departments</td>
<td>Great question nice to have or need to have completed forces</td>
</tr>
<tr>
<td>Don’t know that we have to select one over another. One size may not fit all</td>
<td>The end user needs to make those decisions</td>
</tr>
<tr>
<td>Verification and in the absence of verification</td>
<td>The conflict should be recognized, and highlighted that there are differing opinions and more research needed?</td>
</tr>
<tr>
<td>Precautionary principle</td>
<td>No-offer all and allow fire departments to decide unless this practice is dangerous</td>
</tr>
<tr>
<td>Depends on the level of conflict: they may both be used and or thrown out</td>
<td>Conflict is ok. It’s a natural method of attrition that is healthy in every environment</td>
</tr>
<tr>
<td>Most applicable to that department</td>
<td>No - present both and let end user decide what applies to their situation</td>
</tr>
<tr>
<td>Unless one can be proven ineffective I would allow both with positive and negative aspects clearly defined</td>
<td>Reference sources/research for each</td>
</tr>
<tr>
<td>Both options should be published with information that each group explain their position</td>
<td></td>
</tr>
</tbody>
</table>

BP9: Do you think NFPA or some other organization should view decisions on contamination control through a committee process that is similar to the standards development process?

- Not unless a means is developed to ensure the volunteer concerns are addressed. Current processes don’t come close.
- Why not through the standards development process?
An evolving list of best practices is considered an essential element of a contamination control campaign. The listed best practices should cover the full gambit of activities that can be related to lowing exposures or minimizing contamination transfer across fire service operations.

It is suggested that best practices include a range of different activities accounting for levels of resources that might be available within a given organization and provide “steps” that can be undertaken to achieve progress towards attaining high levels of contamination control with minimal interference with fireground operations. For example, best practices towards a given area should include multiple options for implementing different approaches (e.g. gold/silver/bronze or minimum/better/best).

It is further important that where proposed, best practices must be validated, based on adequate research, and shown to provide the expected benefits. All proposed best practices should include peer-reviewed SOPs and SOGs, where possible.

There was some sentiment to include all best practices, even when there are conflicts between different approaches, to permit organizations the ability to choose the practice that best fits their organization and needs.

Mechanisms are also needed to periodically update best practices and to identify gaps where there are fundamental limitations or other aspects for the specific practice that still need to be addressed.
The Project Team recognized that a number of other industries have workplace exposures that warrant various forms of contamination control. The review of specific practices to mitigate contamination exposures and understanding how specific transfer of contaminants are controlled in these industries was believed to offer useful insights that may have application in the fire service. In addition, a review of the worker population “cultures” and methods of communication in these industries were further explored to determine the ways that worker behaviors are affected for accepting and applying contamination control practices.

Workshop attendees were asked to comment on the usefulness of an approach where contamination control practices applied in selected related industries are highlighted and evaluated for possible application within the fire service. The attendees were specifically asked to determine if there were any advantages for citing work completed in other industries to help define best practices for contamination control.

As part of this project, related industries used for illustration purposes of the proposed approach included healthcare, nuclear power, and hazardous materials and remediation.

- In healthcare, the primary concern is to limit the spread of infectious diseases principally through infection control programs like handwashing and using disinfectants.
- In the nuclear power industry, the primary concern is controlling ionizing radiation and the principal strategies involve limiting exposure through engineering and administrative controls, site segregation, and monitoring.
- The primary concern of hazardous materials response is to prevent exposure to and transfer of hazardous materials. The principal strategies are extensive situation size up, establishment of hazard control zones, and wearing the appropriate level of PPE. OSHA regulations are also followed.

Attendees were asked for feedback on the provision of contamination control philosophies and practices in the selected related industries through a series of questions.
Attendees provided feedback via both group discussions and their responses for the segment questionnaire. Their feedback for this approach is detailed below by each of the posed questions.

VIG1: Which of the related industry vignettes provide useful information as related to fire service contamination control? (Attendees could select multiple industries)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare</td>
<td>Both are highly relevant to our profession</td>
</tr>
<tr>
<td></td>
<td>HazMat response includes setting up appropriate decon measures prior to exposure of team. Priority 1 product identification and appropriate decon setup</td>
</tr>
<tr>
<td>Hazardous Materials Response/Remediation</td>
<td>Healthcare and hazardous materials industries have useful information for a very long time as related to contamination control</td>
</tr>
<tr>
<td>Nuclear Power Industry</td>
<td>Biochemical hazards are the main ones that firefighters encounter</td>
</tr>
<tr>
<td></td>
<td>They all apply to our need to develop solutions</td>
</tr>
<tr>
<td></td>
<td>Most likely to translate to fire service</td>
</tr>
<tr>
<td></td>
<td>The fire service needs to &amp; should learn from all industries that are involved with contamination control</td>
</tr>
<tr>
<td></td>
<td>Healthcare - hand wash, cleaning (disinfecting), HazMat, Gross decon, zones</td>
</tr>
<tr>
<td></td>
<td>Familiarity - excellent concepts for fire &amp; EMS</td>
</tr>
</tbody>
</table>

Why did you make that selection?

Products of combustion are now being talked about as HazMat and could and should be treated as such

Closest to fire-based functions

I liked the ALARA model - trying to get as low as possible; Treating products of combustion like a pathogen – utilizing healthcare model to remove via handwashing etc

Most related to this topic

Any other industry info that can be adapted to the fire service is great

The more sharing of experience, knowledge and practices from a global standpoint the better

Firefighters are familiar with HazMat terminology, some of the contaminant exposure control and decon procedures, and there is no direct-reading instrument to ID all the hazards in fire service like this is in the nuclear power industry.
VIG2: Was any of the information provided on related industries a good representation of best practices?

What industries do you think of when you think of contamination control issues?

We went too quickly through this topic to decide
CDC NIOSH
HazMat contaminated gear is decontaminated or replaced where decon is not possible
Chemical industries; Healthcare
Chemical industries; Surface coating
Healthcare, HazMat, Nuclear industry/chemical companies/electronics industry
Unsure
Healthcare, HazMat
Nuclear, oil industry

Definitely the healthcare industry
Infection control
CDC/Nuclar
Yes - Medical EMS & fire / HazMat EMS & fire
Mining, oil, healthcare, chemical production
Healthcare infection control
Healthcare
Firefighters are familiar with HazMat terminology, some of the contaminant exposure control and decon procedures, and there is no direct-reading instrument to ID all the hazards in fire service like this is in the nuclear power industry.

VIG3: Will the proposed vignettes for related industries provide useful information for drafting Standard Operating Procedures (SOPs)/Standard Operating Guidelines (SOGs) for your organization?

Why or why not? What would make them more useful/relatable?

We went too quickly through this topic to decide
Based on best practices
Some contaminations are similar and it will save time and energy to refer to related industrial practices
We already utilize healthcare concepts in our contamination control practices
Possibly once I dig in to the info a little deeper
There are many ways other industries do things that can be adapted to the fire service industry
It helps to see what makes other industries successful
Model policy. Word document
Possibly - they can provide a guideline to make a specific “best practice” document
HazMat should have some policies that can be adapted to fire service use
Procedures and guidelines are very practical application
Overall yes, but there is still some gray area as to the effectiveness of the programs, intuitively they seem good
Health care

continued on next page
VIG4: What additional tools do you need to support you in your efforts to address fire ground contamination issues?

- Departments across country “buying” in will drive more support along with research & studies
- PowerPoint
- Best practices in the form of SOGs-SOPs
- Specific training
- Media propagation
- Web portal
- Crowd sourcing
- What equipment or product(s) can I use to meet best practice when I have legacy buildings, apparatus, etc.
- A unified message - every organization has their own adjustment to meet their agenda
- Printed material for distribution to policy makers
- The use of technologies to understand exposure would be helpful
- Additional funding
- The validation of research that identifies the problem and then validates (or justifies) the solution.
- Increased eductaion to fire chiefs/management continuous flow of data relational increasing cancer in firefighters
- State & Federal buy in to make change at city, county, state, and federal levels
- Best practices in the form of SOGs-SOPs
- More updated education
- Online forum for best practices sharing
- Best practices field tools and guidelines
- Cost justification/ROI

VIG5: Do you think the concept of proposed vignettes would be helpful tools for building awareness of and gaining support for your contamination control efforts?

Comments:
- Yes - they would provide a guideline
- State & Federal buy in to make change at city, county, state, and federal levels

VIG6: What additional information in the vignettes or related industries should be considered?

- Diagrams
- Pamphlets
- Narrative cartoon video
- Budget impacts
- Chemical process industry
- State & Federal buy in to make change at city, county, state, and federal levels
- Maybe mining?
- Retrospective from a firefighter with cancer. “If I had known...”

continued on next page
The larger majority of workshop attendees believed that examining contamination control approaches in certain related industries for guidance on developing best practices for the fire service was a good idea. Of the three presented related industries, Healthcare and HazMat were deemed the two most relevant industries though some practices in the Nuclear Power industry was also deemed as offering some value to the fire service.

According to the feedback offered by the attendees, the recommended tools from this approach should be provided in the form of SOPs, SOGs, lists of technologies and products that can be used as part of contamination control implementation efforts, and financial information related to securing budgets and showing cost-benefit analysis. The proposed manner of presenting this information included information in the form of pertinent parts of the vignettes that are described using animated videos, PowerPoint presentations, standard, videos, diagrams, and pamphlets.

One recommendation of the project research team was to highlight a specific recommended technology or practice for the fire service by highlighting the effectiveness of an existing approach already used in a relating industry. For example, if periodic and frequent handwashing is recommended for firefighters at stations upon returning from an emergency call, then the placement of hand washing stations or waterless hand sanitizing units could be likened to same practice in hospitals and other healthcare facilities. Similarly, the approach for designating demarcation areas for contamination control (e.g., hot, warm, and cold zones) as currently performed for hazardous materials response and remediation could be laid out alongside a structural fire event to show how the same concept could be applied and managed. Thus, one approach for effectively applying information from related industries would be to show how the practice can be related to and implemented within the fire service.
Supplemental information proposed for a Contamination Control Campaign included establishing common fire service terminology that pertains to contamination issues and creating channels for continuing communication among with the fire service. Both campaign elements are thought to be potential enhancements for affecting awareness in the fire service as related to contamination control issues.

Workshop attendees were asked to comment on a proposed online glossary and Q&A forum. The purpose of the glossary of terms would be to provide the fire service and industry clear terminology, particularly when addressing a technology-based issues. It was proposed that some of the terminology would be created through existing definitions within the relevant NFPA standards with additional changes to promote firefighter understanding of common terms relevant to this area. It was recommended that the online forum activity be associated with the oversight of a general advisory committee to provide some vetting of changing issues.

The purpose of the online question and answer blog/forum is to exchange information and discussion points in the workshop included whether or not there should be restrictions (through a moderator) and how to periodically develop different topics of online conversation.
Q&A FORUM AND GLOSSARY

Attendee Feedback

QA1: Do you think your organization members will use the Q&A forum and the glossary?

Why or why not? What would make them more useful?

Maybe, will depend on individual
Yes, if managed well
Best practices based on testing validation
Very good information
Most of the members of my department are very active on social media
The forum will be a good place to directly exchange ideas and issues. The glossary is all apparent
Some will use it. Those who want more information
Common terminology

Yes
No
Maybe

If presented well
On a somewhat limited basis, but interest and participation is growing
Reference documents like this are very useful
Very good way to communicate
Good option to see common issues and benefit from the collective knowledge of the firefighter community
Too many opinions. Everyone is an expert. “Media validated unreality”

QA2: Should any controls be in place to control access or put constraints for how the Q&A forum is managed?

Comments:
I think that there needs to be some form of restriction
If not, incorrect info will infect the process
Needs to have structure and vetting process to ensure relevancy
There should be monitors to police discussions in order to maintain focus on subject matter
It should be moderated
Forums can become very unwieldy

Yes
No
Maybe

Garbage in is garbage out - validate
Register, log in, department name?
Without controls things get out of hand
Unsure. Ok to sign up with a promise to not send email
Need a forum moderator to maintain online civility and limit potential “commercial” interest that may post “info”.
Peer reviewed / validated / info

continued on next page
QA3: Do you think there is value in having an online glossary? Why or why not?

Comments:
Everyone “talks” differently
Serves the same purpose as doing away with IO codes
Would assist to enhance awareness
Yes, I do
It will help create a unified message
Absolutely. This is important for those who may not be up to speed on terminology so that there is universal understanding
Quick access to definitions
Some terms may be new to users
Online glossary would be helpful
Limited value

Common terminology
Terminology is different geographically
Required to determine definition of terms
Help find/define searches
It will provide a quick reference
If we can agree on terms
Common terminology reduces confusion and may help get correct answers quicker (i.e. no back and forth just to clarify misunderstanding due to terminology)
Standards terminology

QA4: Do you think these tools will provide useful forums for creating awareness and affecting change (e.g. in your department or organization)? Why or Why not? What would make them more useful?

Why or why not? What would make them more useful/relatable?

Very possible depending on who uses it
There is an ever-growing desire for more info and awareness of recommended best practices
Let the fire services better understand the issues related to fire contamination control
The more, easily accessible information that’s available, the more aware people will be
Communication assists in advancing awareness of the topic

App
Need validated direction for standards, resources etc. - must have not a nice to have
We are now a very progressive department
Shows that other departments are doing similar interventions
Blogs are rarely good
Q&A FORUM AND GLOSSARY

Recommendations

There was consensus that a glossary and a Q&A forum would be used and are needed. In some ways the concept of each campaign element is a logical extension of the overall outreach program. There were obvious concerns about making sure the Q&A forum, especially, is not populated with opinion but contains validated, peer-reviewed, accurate information to prevent the proliferation of misconceptions and unsubstantiated claims. The general idea of posting specific topics for related discussion versus a more open-ended forum was discussed, but no specific workshop conclusion was reached other than there should be some level of oversight or management.

The glossary was considered useful if the industry can reach consensus on definitions and can take into account how geography or local area issues may impact term usage and definition.

Longer term, and as part of the bigger campaign, these tools lend themselves to being made accessible through a smart phone application but should be considered as part of an overall campaign effort by whichever organization take the continuing effort.
OUTREACH PLAN AND WEBSITE

Concept

A key aspect of the overall campaign is the approach by which the information identified through the project efforts is disseminated throughout the fire service and to other interested parties. Early on, the project identified that the tools of a contamination control campaign should be adaptable and evolve with changing information. The idea of a website or page that was dedicated to this topic and maintained by an organization with the willingness to update and offer the information was considered a key factor in being able to create the intended awareness and change within the fire service. To this end, efforts within the project took the form of creating an outreach plan and initially designing website layout.

Workshop attendees were asked to provide feedback on the proposed outreach plan and website. The group discussed social media, online forums, internet access, and how prevalent the use of smartphones and tablets is for work within the fire service and related industry.

In an effort to understand what works and what doesn’t, the facilitator asked the group to identify fire service websites they visit and what makes them easy or difficult to navigate. The facilitator also asked attendees to identify which method of learning works best for them – the purpose being to determine how to present content on the proposed website.

The group was shown two different website concepts – one organized by element type (PPE, facility, apparatus, etc.) and the other by tool type (best practices, standards, searchable database, etc.).

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OUTREACH PLAN AND WEBSITE

Concept (continued)

Website Concept 1:

Organized By Element Type:

HOME (Landing Page/Intro)

CONTOAMINATION OVERVIEW
- Overview (Whitepaper)
- FF Testimonial Stories
- Videos
- Practices in Related Industries
- Current Activities from Other Organizations
- State and Local Officials and Other Decision-Makers
- Industrial Hygiene Insurance

FACILITIES
- Best Practices
- Interactive/Searchable Research/Literature Database
- Standards Resource Database
- Tips & Techniques, Users Upload Their SOPs and SOGs
- Comprehensive Fire Service (all levels)
- Architects Specializing in FD
- Designed for Contamination Control
- Cleaning Equipment Manufacturers

EQUIPMENT
- Best Practices
- Interactive/Searchable Research/Literature Database
- Standards Resource Database
- Tips & Techniques, Users Upload Their SOPs and SOGs
- Comprehensive Fire Service (all levels)
- Cleaning Equipment Manufacturers

APPARATUS
- Best Practices
- Interactive/Searchable Research/Literature Database
- Standards Resource Database
- Tips & Techniques, Users Upload Their SOPs and SOGs
- Comprehensive Fire Service (all levels)
- Cleaning Equipment Manufacturers

PPE
- Best Practices
- Interactive/Searchable Research/Literature Database
- Standards Resource Database
- Tips & Techniques, Users Upload Their SOPs and SOGs
- Comprehensive Fire Service (all levels)
- Protective Gear Manufacturers
- Cleaning Equipment Manufacturers

FIRE SCENE
- Best Practices
- Interactive/Searchable Research/Literature Database
- Standards Resource Database
- Tips & Techniques, Users Upload Their SOPs and SOGs
- Comprehensive Fire Service (all levels)
- Cleaning Equipment Manufacturers

RESOURCES
- Best Practices
- Interactive/Searchable Research/Literature Database
- Standards Resource Database
- Tips & Techniques, Users Upload Their SOPs and SOGs
- Q&A Forum
- Glossary
- Contamination Control Blog

continued on next page
OUTREACH PLAN AND WEBSITE

Concept (continued)

Website Concept 2:

Organized By Tool Type:

HOME (Landing Page/Intro)

CONTAMINATION OVERVIEW
• Overview (Whitepaper)
• FF Testimonial Stories
• Videos
• Practices in Related Industries
• Current Activities from Other Organizations

BEST PRACTICES
• Facilities
• Equipment
• Apparatus
• PPE
• Fire Scene

RESEARCH LITERATURE
(Interactive/Searchable Research/Literature Database)
• Facilities
• Equipment
• Apparatus
• PPE
• Fire Scene

STANDARDS (Research Database)
• Facilities
• Equipment
• Apparatus
• PPE
• Fire Scene

TIPS & TECHNIQUES
• Facilities
• Equipment
• Apparatus
• PPE
• Fire Scene

SPECIALISTS
• Comprehensive Fire Service (all levels)
• Architects Specializing in FD
• Designed for Contamination Control
• Protective Gear Manufacturers
• Cleaning Equipment Manufacturers
• State and Local Officials and Other Decision-Makers
• Industrial Hygiene Insurance

RESOURCES
• Contamination Control Blog
• Q&A Forum
• Glossary

continued on next page
As with other campaign elements, attendees provided feedback via group discussions and a segment-specific questionnaire. The specific questions and attendee responses in this areas are presented below.

**OR1: Do you use social media? If, so which platforms?**

- **Facebook**: 24
- **Twitter**: 14
- **LinkedIn**: 13
- **Instagram**: 12
- **Other**: 4
- **None**: 2

**Comments:**
- On LinkedIn, On Twitter/rarely use
- Department uses Twitter
- Google/Yahoo Groups
- WeChat
- GroupMe (messaging app)
- Mags - online - Google etc
- Very little on Twitter

**OR2: Do you participate in any online forums?**

- Fire Engineering: 0
- AOL: 5
- IAFC: 10
- Local IAFF: 15
- FL Fire Marshal Assoc: 20
- National Assoc. of SFMs: 10
- Elec Veh Fires: 5
- iWomen: 15
- American Welding Society: 20
- American Industrial Hygiene Assoc: 10
- NIOSH: 0
- None: 0

**Comments:**
- Not often
- Best practices for handling Electrical Vehicle Fires
- Local 22 IAFF
- GroupMe (messaging app)
- Some Twitter
- Yes
- Rarely, mostly to read vs submit. FireEngineering.com

**OR3: Does your department have broadband Internet service?**

- Yes: 2
- No: 29

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OUTREACH PLAN AND WEBSITE

Attendee Feedback (continued)

OR4: Do you have/work with smart phones or tablets?

30% Yes, 70% No

OR5: What Fire Service-related websites do you visit regularly?

<table>
<thead>
<tr>
<th>Website</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Engineering</td>
<td>20</td>
</tr>
<tr>
<td>Fire House</td>
<td>15</td>
</tr>
<tr>
<td>IAFF</td>
<td>10</td>
</tr>
<tr>
<td>Fire Rescue 1</td>
<td>5</td>
</tr>
<tr>
<td>Statter911</td>
<td>3</td>
</tr>
<tr>
<td>IFSI</td>
<td>2</td>
</tr>
<tr>
<td>Fire Apparatus</td>
<td>2</td>
</tr>
<tr>
<td>State FF</td>
<td>2</td>
</tr>
<tr>
<td>NVFC</td>
<td>1</td>
</tr>
<tr>
<td>IAFC CAFC</td>
<td>1</td>
</tr>
<tr>
<td>FFCA</td>
<td>1</td>
</tr>
<tr>
<td>YouTube</td>
<td>1</td>
</tr>
<tr>
<td>Target Solutions - Canvas</td>
<td>1</td>
</tr>
<tr>
<td>Daily Dispatch</td>
<td>1</td>
</tr>
<tr>
<td>PPE101.com</td>
<td>1</td>
</tr>
</tbody>
</table>

Comments:
- State - (VA)
- YouTube - firefighting-related videos
- (1) IAFF; (2) NFPA; (3) IFSI; (4) NIOSH; (5) Fire magazines
- IAFF, USFA, NIOSH FF Fatality program, NFPA, Fire Engineering, Fire House
- Various manufacturers, In-house website
- Get emails from most publications and IAFC, Daily Dispatch, click links

OR6: What Fire Service-related websites have you used for specific information or projects?

<table>
<thead>
<tr>
<th>Website</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFPA</td>
<td>15</td>
</tr>
<tr>
<td>IAFF</td>
<td>12</td>
</tr>
<tr>
<td>Fire House</td>
<td>9</td>
</tr>
<tr>
<td>Fire Rescue 1</td>
<td>6</td>
</tr>
<tr>
<td>IFSI</td>
<td>3</td>
</tr>
<tr>
<td>NIST</td>
<td>3</td>
</tr>
<tr>
<td>Northwest Safety Clean</td>
<td>2</td>
</tr>
<tr>
<td>NFFFF</td>
<td>2</td>
</tr>
<tr>
<td>NFPA Metro Chiefs</td>
<td>2</td>
</tr>
<tr>
<td>Some Vendors</td>
<td>2</td>
</tr>
<tr>
<td>YouTube</td>
<td>2</td>
</tr>
<tr>
<td>RCW</td>
<td>2</td>
</tr>
<tr>
<td>Statter911</td>
<td>1</td>
</tr>
<tr>
<td>Target Solutions - Canvas</td>
<td>1</td>
</tr>
<tr>
<td>Daily Dispatch</td>
<td>1</td>
</tr>
</tbody>
</table>

One respondent also specifically described, “YouTube firefighting-related videos

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OUTREACH PLAN AND WEBSITE

Attendee Feedback (continued)

OR7: Do you personally use websites to learn new information, find out updates to information you routinely use? If you answered yes, please answer: When you use a website to find information, do you prefer visual or text navigation cues (i.e., what prompts you to go to another page/further information)?

OR7: When you use a website to find information, do you prefer visual or text navigation cues?

OR8: Is there a website that you routinely use that you find especially easy to navigate? Please explain what makes it easy.

Comments:

Google, get info on a broad range of sites
UL and NFPA websites; taxonomy and category are very clear and concise
Visual cues to different articles and easy to navigate topics
Google
IFSI - very easy! No logon
Simple, easy graphics with minimal wording to find where I need to go. Once there, it is more specific via wording. The problem with many sites is that it is hard to find where to start. The site has too much on the page
Same as Q5 - they are simple to use
All above (could mean Fire Engineering, Fire Rescue - firehouse.com, Target Solutions - Canvas, NIVC - SAFER - US Fire Admin - OSHA, NFPA - Daily Dispatch - City, County, State, & Federal Laws - websites)
McMaster-Carr - pictures - It is simple & intuitive
If a site is overwhelming I move on to the next site

OSHA’s website improvements have made their website much easier to navigate. More intuitive associations of topics and resources. Also CPWR - their eTools are pretty well done. Check out OSHA’s eTools and CPWR’s silica control tool as possible web templates a FD could use to ID contamination prevention/control on this TBD site

Websites with short/concise links to drill down to what I’m looking for
OUTREACH PLAN AND WEBSITE

Attendee Feedback (continued)

OR9: Is there a website that you routinely use that you find difficult to navigate? Please explain why it is difficult. Please explain what makes it easy.

Please explain what makes it difficult:

My employer’s!! (Ohio. bwc.com) “Clunky” navigation, poor organization of related topics, dead links, topics not integrated between pages. [But we’re working on it…]

Grainger.com

I can’t give a specific website, but I hate websites that have an overload of information thrown at you – just keep it simple and be easy for the person to view and find things

Many do not use plain, easy-to-understand language

NFPA - it’s not easy or functional to find information

or

NFPA (logon issues, code lookup is difficult); IAFF (logon issues, not set up well)

NFPA: fee based, no visual cues, info isn’t abbreviated

NVFC – too many compartments

Simple, easy graphics with minimal wording to find where I need to go. Once there, it is more specific via wording. The problem with many sites is that it is hard to find where to start. The site has too much on the page

Websites that contain a lot of small text

OR10: How do you personally best learn (on any topic)?

(some attendees marked more than one style)

One attendee commented, “Infographics”
OUTREACH PLAN AND WEBSITE

Attendee Feedback (continued)

OR11: How do you think we should convey information on the contamination control website for others?

**Comments:**
- I’m a detailed person, try to get as much info as possible
- So everybody feels comfortable
- For firefighters use videos
- A good variety of visual, text, and video soundbites would be ideal
- Printed pamphlets
- Everybody learns differently
- Links to research sub use in infographics or video linking to substantial research paper
- Creation of an app
- Text and most detailed level with graphics for support and visual interest
- Illustration
- Links to additional resources and research

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Campaign for Fire Service Contamination Control

continued on next page
ATTENDEE FEEDBACK (continued)

OR12: How valuable do you think testimonials/case studies will be to the credibility and effectiveness of this communication effort? (i.e., a fire service representative who explains how his/her department addressed contamination problems)? (select one) If you chose “Somewhat” or “Not” valuable, please describe why not and/or what would make testimonials/case studies more valuable:

If you chose “Somewhat” or “Not” valuable, please describe why not and/or what would make testimonials/case studies more valuable:

This allows others to “see” how they went through issues and resolved them
If the testimonial is too wordy I will avoid it
Most are career based and volunteers want to hear from other volunteers
“don’t reinvent the wheel”; implement over time as buy-in and money allows
Different fire departments have different budgets, resources, etc. Hearing a testimonial from a resource rich fire department does one no good.
Make it personal to line firefighter, driving home to goal and info
Each department has their own limitations, so how others overcame their particular issues (without a lot of $!!), would be helpful
A good resource for management/policy makers; not as much for line members
Keep it short and realistic

74.2% 22.6% 3.2%
OR13: When educating members of your organization about contamination control, how important do you think it will be to include introductory explanation of the dangers of contamination? (select one)

Comments:
- Essential - many people still don’t realize the risks
- People know the risks of an active IDLH atmosphere but don’t even think about contamination of the apparatus or station
- Essential - many people still don’t realize the risks
- Facts not speculation!
OUTREACH PLAN AND WEBSITE

Attendee Feedback (continued)

OR14: How concerned are you about fire service noncompliance due to such issues as bravado, fears of being viewed as a worry-wart, etc.? (select one) If you think this is an issue that should be addressed, how do you think it can be addressed? What are some ways you think those concerns can be overcome?

Comments:

All you needed to do was hear comments in any fire service conference to understand this is very much an issue

Shown from volunteer viewpoint

Top down multi prong union and command staff

Linking/stressing the connection between firefighter occupational illness & contamination

Much needed

The problem I face is the lack of action by the admin. The street level members are asking for guidance that is never coming

This is a very pervasive issue...volunteer departments standards are not there to comply with all safety/contamination standards

Providing facts and anecdotal evidence can drive the point home

The issue of bravado should be addressed head on. The bravado will kill firefighters. Wearing clean gear, using SCBA is foolish and anyone who does not follow these rules should not be allowed to fight fires.

You almost need to scare the members of the fire service to get them to change their culture. The message has to be very powerful to get through to them

3 prong: (1) leadership has to buy-in commissioner Finn; (2) individuals have to believe it is important to them; (3) organizational culture is there support by company officer to control exposures

Education. Justifying, via inducted research, the process

Education and enforcement from the top down

Create a video using members of your organization. Using respected members/role models really helps to connect to the other members

This is a cultural issue that needs to be addressed from the top down

Explain the benefits, and the cons when not followed or done correctly

Need to get buy-in from troops

Resources are more of a problem

This is an implementation problem related to leadership and courage. Focus should be placed on fostering confidence in “leaders” to do what is right.
OUTREACH PLAN AND WEBSITE

Attendee Feedback (continued)

OR15: Are you already implementing or do you plan to implement a contamination control program in your organization? If you answered “Yes”, have you implemented or will you implement this program all at once or one piece at a time as resources and time permit? If you will implement in segments, how will you prioritize those segments and what tools would be helpful for implementation?

- Yes: 78.6%
- No: 7.1%
- N/A: 14.3%

continued on next page
<table>
<thead>
<tr>
<th>Campaign for Fire Service Contamination Control</th>
</tr>
</thead>
</table>

### OUTREACH PLAN AND WEBSITE

#### Attendee Feedback (OR15 continued)

<table>
<thead>
<tr>
<th>If you answered “Yes,” have you implemented or will you implement this program all at once or one piece at a time as resources and time permit?</th>
<th>If you will implement in segments, how will you prioritize those segments and what tools would be helpful for implementation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phased in due to cost and size of department</td>
<td>Easy first, more costly/harder issues phased in</td>
</tr>
<tr>
<td>Phased in</td>
<td>Fireground / Equipment / Station</td>
</tr>
<tr>
<td>One piece at a time</td>
<td>Prioritized by most effect for input of money</td>
</tr>
<tr>
<td>As resources and time permit. Attempt to prioritize rollout. Important to commit to a “continuous improvement”</td>
<td>This is where evaluation of standards and best practices will assist.</td>
</tr>
<tr>
<td>Do not respond to fire scenes except afterward; we are state regulatory agency; fire &amp; arson investigates</td>
<td>Respiratory protect / Physical (life scans) every 2 years</td>
</tr>
<tr>
<td>One piece at a time</td>
<td>Videos / PPT</td>
</tr>
</tbody>
</table>

Yes. We have Plymovents, separate eating and living areas and have fire wipes available. Will be working on doing more in the future

<table>
<thead>
<tr>
<th>One piece at a time as resources and time permit</th>
<th>Budget considerations vs objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual components will/are implemented as resources, education, and compliance dictates</td>
<td>(1) Low hanging fruit/easy to implement; (2) Biggest impact on contamination reduction; (3) long term</td>
</tr>
<tr>
<td>Healthy In, Healthy Out</td>
<td></td>
</tr>
<tr>
<td>Resources available to start with. Implementing too much can “turn off” the ff in complying</td>
<td>(1) What can be conducted with the resources available; (2) plan and budget for other segments</td>
</tr>
<tr>
<td>Organization does not have or does not have plans to implement at this time</td>
<td></td>
</tr>
<tr>
<td>In early stages as resources/finance permits</td>
<td>We are forced to implement low budget items first. Some data on how similar size departments have been successful in implementable procedures</td>
</tr>
<tr>
<td>We are still developing our strategy</td>
<td>Decon at the scene and when you’re returning to quarters. A simple step process showing what can be done and the benefit/gains from doing so</td>
</tr>
</tbody>
</table>

Cancer - contamination reduction program

<table>
<thead>
<tr>
<th>Partial at this time</th>
<th>Would like to see how others do things</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hopefully all at once!</td>
<td></td>
</tr>
<tr>
<td>We have implemented some items and are working on more areas to increase contamination control</td>
<td></td>
</tr>
<tr>
<td>One piece at a time</td>
<td></td>
</tr>
<tr>
<td>It looks good on paper but not enforced, one piece with different component.</td>
<td></td>
</tr>
<tr>
<td>No longer active</td>
<td></td>
</tr>
<tr>
<td>We’re a regulator, not a fire service, no “N/A”</td>
<td></td>
</tr>
<tr>
<td>One piece at a time</td>
<td>Start with low hanging fruit</td>
</tr>
</tbody>
</table>
OUTREACH PLAN AND WEBSITE

Attendee Feedback (continued)

Website Concepts

• Concept 1 = Organized by element type (PPE, facility, apparatus, etc.)
• Concept 2 = Organized by tool (best practices, standards, searchable database, etc.)

WSI: Which website would be easier to navigate?

What makes that format easier to navigate?

(1) But add best practices
(1) Especially by volunteers
Combination
(2) More concise and easy to understand
(1) Picture
(1) It allows for search by topic, a more logical progression
(1) Being able to navigate by element type seems more logical to me
(1) Large visual buttons with specific categories
(1) A combination of both is best. Organized by element type AND best practice
(1) Different jobs; different goals - I can only afford PPE this year
(1) Easy to find a specific topic - I don’t have to search. For example in #2 where do I start to find apparatus. If I have to keep searching, I'll go elsewhere. It should only take a couple of clicks to find what I want.
(2) Seems it would be easier to have all subjects grouped together
(1) Simple to use. Lets you get information directly related to that item
(1) Seems more intuitive
(2) On either of these questions, I think a stakeholder could miss a contamination prevention intervention by focusing on a specific ‘element’ rather than on an over-arching concept (tool)

38.7%
61.3%
Concept 1 (Element)
Concept 2 (Tool)

continued on next page
WS2: Which website would be easier to find the information you need? What makes that format easier to find the information you need?

What makes that format easier to find the information you need?

(1) Add best practices
(1) Photo expresses our main point better than concept 2
Combination
(2) I prefer layout and picture on site #1 but I like both
(2) It depends on the end users what kind of information they want to navigate
(2) Picture
Both
(1) If I'm interested in a specific topic, or need certain information, I think that it will be easier to search by topic (element)
(1) Combination of both (WSI) Organized by element type AND best practice
(1) Easy to find a specific topic - I don’t have to search. For example in #2 where do I start to find apparatus. If I have to keep searching, I’ll go elsewhere. It should only take a couple of clicks to find what I want.
(2) Seems it would be easier to have all subjects grouped together
(1) Depending on your role in the department it allows you to easily locate info
(1) Concept one - easier to work with the one by type
(2) On either of these questions, I think a stakeholder could miss a contamination prevention intervention by focusing on a specific 'element' rather than on an over-arching concept (tool)
OUTREACH PLAN AND WEBSITE

Attendee Feedback (continued)

WS3: Which website would help you search for information you need? What makes that format more helpful for your search needs?

What makes that format more helpful for your search needs?

(1) Add best practices
(1) Protect the Protector is great!!!
Combination
(2) Looks good, remove firefighter walking into fire. Protect the Protector is fine
(2) Picture
I like “Protect the Protectors”
(1) Combination of both (WSI & ?) Organized by element type AND best practice

Easy to find a specific topic - I don’t have to search. For example in #2 where do I start to find apparatus. If I have to keep searching, I’ll go elsewhere. It should only take a couple of clicks to find what I want.

(2) Make sure that images are correct, safe, modern, and from North America. I do like the “Protect the Protector” theme

Not sure - keyword/MESH topic search? I assume that’s what the magnifying glass icon is for...

continued on next page
Facebook was found to be the most popular social media platform among attendees and most attendees do not participate in online forums – more research should be done to determine why, especially if the host of the contamination control program wants the fire service and related industry to engage and interact with the website and the tools that are part of an online forum. It can be presumed that if this forum is focused on contamination control and has useful best practices and SOPs that engagement will be high. However, contamination control can also be considered in the context of overall firefighter health and safety. The tradeoff between highlighting contamination control and addressing other firefighter health and safety issues needs to be considered by the host for creating the intended awareness without burying the information among other topics.

According to the majority of workshop attendee responses, the website needs to rely on succinct, clear language and should have visuals and infographics where they add value to the user. This approach was believed to offer greater effectiveness in getting key messages out to the fire service. Case studies and testimonials should be used but they should focus on a variety of different end users from small and large cities, volunteer and paid departments, etc. – the focus should not solely be on big city, paid departments.

The issue of bravado needs to be addressed because it is getting in the way of members and departments implementing best practices. The language of the website, the testimonials and case studies, and the best practices can all be used to change the mindset and encourage implementation of best practices for contamination control.

While two thirds of the attendees expressed a preference for website concept 1 (organized by element), many who selected concept 1 noted in the comments that they really preferred a combination of the two. A best practice for implementing the website is to create both formats – allow the user to work by element or by tool.

Those who commented on the theme like the “Protect the Protectors” concept and believe that this message approach should be maintained. Images used on the website should show clean firefighters wherever possible to promote the image of contamination control. In addition, there was the recommendation that any visuals be realistic in terms of fire operations.
GENERAL WORKSHOP FEEDBACK

Concept

Attendees were asked to respond to questions related to the general campaign concept, there was no presentation on the subject.

Attendee Feedback

AW1: What do you think is the best way to make the campaign viable and accessible to the public?

Please specify:

(10) (on the social media line) For awareness link to website
(4) (Other) printed material
(4) (Other) PSA
(Social Media) Facebook page; (Other) App

All forms - and try to get some of the popular fire service posters to post materials and info i.e. the Finns, Haltons, etc.

Awareness in all forms for different areas of the country to address needs. Each area has their challenges to achieve - how do we get these

Awareness, advertising, and distribution

AW2: Is NFPA a reasonable organization for hosting and maintaining a website?

Comments:

Or other organization focused on cancer prevention
Maybe. Cannot cost or require login
If they dedicated time, funding and adequate resources

continued on next page
GENERAL WORKSHOP FEEDBACK

Attendee Feedback (continued)

**AW3: What topics would you like to see as the subject of future contamination control research?**

<table>
<thead>
<tr>
<th>Topic</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Facilities</td>
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<td>On-Scene/Gross Dec</td>
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<td>Products</td>
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<tr>
<td>PPE</td>
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<tr>
<td>Apparatus</td>
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<tr>
<td>Equipment</td>
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<tr>
<td>Volunteer</td>
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<tr>
<td>Saunas</td>
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<tr>
<td>Showers</td>
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<tr>
<td>Track Exposures</td>
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<tr>
<td>Best Practices</td>
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<tr>
<td>Cross Containment w/Public</td>
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<tr>
<td>Comparison</td>
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</tbody>
</table>

**Comments:**

On-site gross decon
What type of gross decon is effective
What type of soaps/wipes are most effective
Saunas - good or bad? Why?
Showers - hot and cold or cold then hot?
Renovation Triage
Do wipes work
Cost effective contamination control for volunteer fire service
Gap analysis for volunteer compliance
More needed on apparatus contamination best practices in decon & remediation needed
Best practices for firefighters contamination control (including station design, PPE, apparatus, SCBA, etc.)
Correlation data/evidence of departments that are utilizing contamination control at a high-level vs those that don’t and corresponding cancer rates

**Efficacy of sauna use/pros-cons; “Shower” vs hot or cold**

Hose cleaning; apparatus cleaning; apparatus design; diesel exhaust - how effective are ceramic/no smoke systems. Even though they are 85–90% effective, it still isn’t 100%. Direct capture is still required

A component that singles out fire service leaders, chiefs, union leaders and volunteer boards - those who control the purse strings have the power

We have several different voices - collectively voice & direction. Identify - short and long term goals that can make an impact to change. Big bang items require - local, county, state, country change - can be handled within by company and chief officers - budget & fund direction get radical (?) to make change & continue to evolve

Wipe efficacy, brands etc. Gross decon efficacy
I think that everything was covered

Cross contamination with the public; contamination of apparatus, cabs, tools; contamination of SCBAs; reporting tools for firefighter exposures

Cleaning effectiveness: machines for turnout gear; soap and water vs wipes for people; How Clean is Clean?

*continued on next page*
GENERAL WORKSHOP FEEDBACK

Attendee Feedback (continued)

AW4: Is there anything else you would like to share about this workshop or things you would like to see made available to the fire service related to contamination control?

Comments:

Great job!! I do think 2 full days with interaction/discussion between all specific issues would help more in directing the ideas to move forward

Any best practices should be segmented by volunteer and career

Emerging trends & strategies to mitigate contamination - notion of 'continuous improvement'

Make a presentation? The related materials to the fire services personnel in China to raise the awareness of China fire services

More focus on volunteer issues; budget constraints, lack of enforcement or standards

Common terminology

Gold standard

Self-assessment of department

Just what we are here for - best practice manuals

We have a powerful resource of minds to achieve our goal we need to do what is right. That is a challenge. One direction for North American firefighters - paid & volunteer - it is a health & safety issue - by doing it right - we will save lives, money, and improve well being

Who is doing some of these things already?

Who is doing research?

What research is being proposed? Who?

Great stuff!

Well managed

continued on next page
GENERAL WORKSHOP FEEDBACK

Recommendations

The campaign must provide a method to access each tool in a way that is specific to each audience (volunteer/career, position in department, place in community, etc) – this means it must use vocabulary that is meaningful to each distinct audience and address the pain points of each audience. All tools in the campaign must be reviewed and updated on a regular basis.

The industry needs an easy-to-understand tutorial on the standards development and revision process. This should be made available in both video and written formats.

Standards writing organizations must become more flexible and provide guidance in everyday language and adapt appropriate requirements to different levels of capability – for instance, minimum, middle, best practice.
### ANNEX A: COLUMBUS WORKSHOP ATTENDANCE

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Affiliation</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steve</td>
<td>Allison</td>
<td>Fire-Dex</td>
<td>M</td>
</tr>
<tr>
<td>Ayana</td>
<td>Andrews-Joseph</td>
<td>Virginia Division of Consolidated Laboratory Services</td>
<td>E</td>
</tr>
<tr>
<td>Stephen</td>
<td>Belski</td>
<td>NFPA and Somerville Fire Dept.</td>
<td>C</td>
</tr>
<tr>
<td>William</td>
<td>Bennison</td>
<td>Columbus Fire Dept.</td>
<td>C</td>
</tr>
<tr>
<td>David</td>
<td>Bernzweig</td>
<td>Columbus Fire Dept.</td>
<td>L</td>
</tr>
<tr>
<td>Rick</td>
<td>Best</td>
<td>National Fallen Fire Fighter Foundation</td>
<td>SE</td>
</tr>
<tr>
<td>Ken</td>
<td>Block</td>
<td>Edmonton Fire Rescue Services and Metro Chiefs</td>
<td>U</td>
</tr>
<tr>
<td>Ken</td>
<td>Brown</td>
<td>VA State Firefighter’s Association &amp; NVFC</td>
<td>C</td>
</tr>
<tr>
<td>Jeff</td>
<td>Burgess</td>
<td>University of Arizona</td>
<td>RT</td>
</tr>
<tr>
<td>Alberto</td>
<td>Caban-Martinez</td>
<td>University of Miami</td>
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</tr>
<tr>
<td>Ed</td>
<td>Conlin</td>
<td>NFPA</td>
<td>SE</td>
</tr>
<tr>
<td>Paul</td>
<td>Erickson</td>
<td>Lemay, Erickson, and Willcox Architects</td>
<td>SE</td>
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<tr>
<td>Chris</td>
<td>Eysser</td>
<td>FDNY</td>
<td>U</td>
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<tr>
<td>Kenny</td>
<td>Fent</td>
<td>NIOSH</td>
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<tr>
<td>Beth</td>
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<td>Kent Fire Dept.</td>
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<td>Casey</td>
<td>Grant</td>
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<tr>
<td>John</td>
<td>Granby</td>
<td>Lion Fire Responder Products</td>
<td>M</td>
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<tr>
<td>John</td>
<td>Gulotta</td>
<td>Tucson Fire Dept.</td>
<td>U</td>
</tr>
<tr>
<td>Julius</td>
<td>Halas</td>
<td>Florida SFM and Florida Fire Service Rep</td>
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<td>Bobby</td>
<td>Halton</td>
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<tr>
<td>Matt</td>
<td>Holloway</td>
<td>Houston Fire Dept., IAFF Local 341</td>
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<tr>
<td>Jeff</td>
<td>Hutchins</td>
<td>Ohio Bureau of Workers’ Compensation</td>
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<td>Dan</td>
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<td>Dennis</td>
<td>Merrigan</td>
<td>Philadelphia Fire Dept.</td>
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<tr>
<td>Joe</td>
<td>Molis</td>
<td>NFPA and Providence Fire Dept.</td>
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*continued on next page*
ANNEX A: COLUMBUS WORKSHOP ATTENDANCE (continued)

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Affiliation</th>
<th>Group</th>
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<tbody>
<tr>
<td>Paul</td>
<td>Moore</td>
<td>Tucson Fire Dept.</td>
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<td>Mike</td>
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<td>Carlos</td>
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<tr>
<td>Johnathan</td>
<td>Pangborn</td>
<td>DCC/University of Miami</td>
<td>RT</td>
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<tr>
<td>Peg</td>
<td>Paul</td>
<td>Peg Paul and Associates</td>
<td>SE</td>
</tr>
<tr>
<td>Larry</td>
<td>Petrick</td>
<td>IAFF</td>
<td>L</td>
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<tr>
<td>Jay</td>
<td>Petrillo</td>
<td>NFPA and North Providence Fire Dept.</td>
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<tr>
<td>Ned</td>
<td>Pettus</td>
<td>Columbus Safety Director</td>
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<td>Popp</td>
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<td>Retarides</td>
<td>Virginia Division of Consolidated Laboratory Services</td>
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<tr>
<td>Jim</td>
<td>Riley</td>
<td>Boston Fire Dept. Local 718</td>
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<td>Molly</td>
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<td>Virginia Beach Fire Dept.</td>
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<tr>
<td>Mark</td>
<td>Rine</td>
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<td>Kevin</td>
<td>Roche</td>
<td>Facet Consulting</td>
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<td>Ali Warren</td>
<td>Rothrock</td>
<td>I-Women and King of Prussia Vol Fire Company</td>
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<td>Natasha</td>
<td>Schaefer Solle</td>
<td>University of Miami</td>
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<td>Schmid</td>
<td>FIERO and Fortunes Collide</td>
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<td>Stagnaro</td>
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<td>Weise</td>
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<tr>
<td>Ken</td>
<td>Willette</td>
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<td>SE</td>
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**TOTALS** 63

**Group Code Members:**

- C  Consumer ................ 12
- E  Enforcer ................ 5
- L  Labor .................... 4
- M  Manufacturers ............ 5
- RT Research Testing ........ 10
- SE Special Expert ........... 11
- U  User ...................... 16