

# MINUTES OF THE MEETING

## TECHNICAL CORRELATING COMMITTEE ON FIRE AND EMERGENCY SERVICES PROTECTIVE CLOTHING AND EQUIPMENT

Baltimore, MD  
11 - 13 October 2011

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11 October, 2011

### Agenda Items 1 -- 3: Call to Order, Introduction of Members and Guests, and Committee Procedures

TCC Chairman Bill Haskell called the meeting to order at 0900 and asked everyone to introduce themselves. David Trebisacci, NFPA Staff Liaison, then read the NFPA committee operating procedures and provided an overview of a new Codes and Standards process that will be implemented later this year. Sign-in sheets for TCC members and guests were circulated. The following members and guests were present:

#### Members Present:

Bill Haskell, NIOSH-NPPTL, Chairman  
Eric Beck, MSA, Secretary  
David Trebisacci, NFPA Staff Liaison

Jason Allen, Intertek Testing Services  
Christina Baxter, US Department of Defense  
Steven Corrado, Underwriters Laboratories  
Dean Cox, Fairfax County Fire & Rescue  
Rich Duffy, IAFF  
Cristine Fargo, ISEA  
Pat Gleason, SEI  
Kim Henry, PBI Performance Products  
Karen Lehtonen, Lion Apparel  
Bill Van Lent, Veridian Limited, Representing FEMSA  
Anthony Putorti, NIST  
Dan Rossos, Portland Fire & Rescue  
Grace Stull, International Personal Protection  
Jeff Stull, International Personal Protection  
Rick Swan, IAFF 2881/CDF Firefighters  
Bruce Varner, Santa Rosa FD, ret.  
Richard Young, DuPont

#### Guests Present:

Ron Bove	W.L. Gore & Associates
Jason Cole	Kappler
Tim Gardner	3M Occ. Health & Env. Safety
Beverly Gullledge	Scott Safety
John Langley	Langley Consulting (Kappler)
Philip Mann	Kappler
Michael McKenna	SacMetro Fire (ret) / Michael McKenna & Assoc.
Jeremy Metz	West Metro Fire Rescue

**Agenda Item 4: Chairman's Remarks**

Chairman Haskell relayed Past Chairman Les Boord's kind regards and best wishes to the committee. Bill informed us that Les would be retiring from NIOSH on 4 November 2011. Roland Berry Ann will serve as the Acting Director at the NPPTL until Les's permanent successor is named.

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**Agenda Item 5: Approval of the Meeting Minutes**

The Minutes of the TCC meeting held in Colorado Springs, Colorado, 24 - 26 May 2011, which were previously emailed to TCC members, were distributed to the TCC. The TCC was asked to review the Minutes for corrections, modifications, or deletions.

**MOTION BY PAT GLEASON, SECOND BY KAREN LEHTONEN**

**To approve the minutes of the 24-26 May TCC meeting in Colorado Springs, Colorado.**

**MOTION CARRIED**

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**Agenda Item 7: Fire Protection Research Foundation Update – Casey Grant**

Casey made a presentation to the committee (Casey's Power Point is attached to these minutes) that included:

1. Review of completed research projects
2. Review of current research initiatives
3. Review of research needs

Casey also informed the committee about the "Code Fund Projects", and the process for applying for those funds. A copy of the Code Fund Project Statement Form is attached to these minutes.

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**Agenda Item 8: ROP on NFPA 1999, Standard on Protective Clothing for Emergency Medical Operations**

Bill Haskell reviewed the proposals.

**MOTION BY KAREN LEHTONEN, SECOND BY RICH DUFFY**

To accept the actions taken on all proposals for NFPA 1999, with the one TCC note on a specific issue for the TC to respond to, and submit these to a letter ballot of the TCC to become the TCC's official NFPA 1999 ROP.

**MOTION CARRIED**

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**Agenda Item 9: ROP on NFPA 1855, Selection, Care, and Maintenance of Protective Ensembles for Technical Rescue Incidents**

TC Chairman Cox reviewed the public and committee proposals.

**MOTION BY DEAN COX, SECOND BY DAN ROSSOS**

To accept the actions taken on all proposals for NFPA 1855, with one TCC note on a specific issue for the TC to respond to, and submit these to a letter ballot of the TCC to become the TCC's official NFPA 1855 ROP.

**MOTION CARRIED**

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**Agenda Item 10: ROP on NFPA 1852, Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA)**

**MOTION BY DAN ROSSOS, SECOND BY WILLIAM VAN LENT.**

To accept the actions taken on all proposals for NFPA 1852, with no TCC notes, and submit these to a letter ballot of the TCC to become the TCC's official NFPA 1852 ROP.

**MOTION CARRIED**

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**Agenda Item 11: ROP on NFPA 1981, Standard on Open-Circuit Self Contained Breathing Apparatus (SCBA)**

TC Chairman Dan Rossos reviewed each public and committee proposal.

**MOTION BY DAN ROSSOS, SECOND BY RICH DUFFY**

To accept the actions taken on all proposals for NFPA 1981, with the four TCC notes on specific issues for the TC to respond to, and submit these to a letter ballot of the TCC to become the TCC's official NFPA 1981 ROP.

**MOTION CARRIED**

There was discussion regarding the structure of NFPA 1981 relating to the unique needs of structural firefighters vs the needs of tactical responders, such as the law enforcement community. It was agreed that the TCC would send communication to the Law Enforcement and Military communities highlighting the proposal for additional NFPA 1981 requirements for non-fire suppression activities.

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**Agenda Item 12: ROP on NFPA 1989, Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection**

Chairman Rossos reviewed the public and committee proposals.

**MOTION BY DAN ROSSOS, SECOND BY DEAN COX**

To accept the actions taken on all proposals for NFPA 1989, with one TCC note on a specific issue for the TC to respond to, and submit these to a letter ballot of the TCC to become the TCC's official NFPA 1989 ROP.

**MOTION CARRIED**

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**Agenda Item 13: ROP on NFPA 1851, Standard on Selection, Care and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting**

TC Member Bill Haskell reviewed the proposals.

**MOTION BY PAT GLEASON, SECOND BY RICHARD YOUNG**

To accept the actions taken on all proposals for NFPA 1851 ROP, with no TCC notes, and submit these to a letter ballot of the TCC to become the TCC's official NFPA 1851 ROP.

**MOTION CARRIED**

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**Agenda Item 14: ROP on NFPA 1982, Standard on Personal Alert Safety Systems (PASS)**

Chairman Bruce Varner reviewed the public and committee proposals.

**MOTION BY BRUCE VARNER, SECOND BY JASON ALLEN**

To accept the actions taken on all proposals for NFPA 1982, with no TCC notes, and submit these to a letter ballot of the TCC to become the TCC's official NFPA 1982 ROP.

**MOTION CARRIED**

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**Agenda Item 15: ROC on NFPA 1801, Standard on Thermal Imagers for the Fire Service**

TC Chairman Varner provided an overview of the challenges that his team has faced in developing this standard. Rather than using the TIA methodology to update the current standard, the team has decided that it would be best to "short cycle" the next revision of the standard.

Bruce reviewed the public comments with the committee.

**MOTION BY BRUCE VARNER, SECOND BY PAT GLEASON**

Accept the ROC of the proposed NFPA 1801 Standard, with no TCC notes, and submit this to a letter ballot of the TCC to become the official TCC ROC on NFPA 1801.

**MOTION CARRIED**

Staff Liaison Trebisacci informed the committee that the "short-cycled" edition of NFPA 1801 is scheduled for public release on May 29, 2012.

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**Agenda Item 16: Chair Reports**

**TC on ESE**

TC Chairman Varner provided the update. Bruce informed the committee that the TC will be meeting in February 2012 in San Antonio. Objectives of that meeting include:

- Discussion of radio system interoperability
- Gathering input for a portable radio standard
- Work on the "umbrella document"
- Exploring re-organization options for committee structure

**MOTION BY RICH DUFFY, SECOND BY JEFF STULL**

The TCC requests that the NFPA Standards Council authorize the development of an NFPA Standard for firefighter handheld, voice communication, radio devices.

**MOTION CARRIED**

Staff Liaison Trebisacci provided Bruce Varner a copy of the NFPA New Project Initiation Form.

**TC on EMS**

TC Chairman Haskell provided the update. Bill announced that the TC will be meeting in San Antonio, beginning on 13 March, 2012. He reported that the committee has about 14 members, with two new members added last year from the user category. Bill expressed his desire to retire as the chairman of this committee. The first step will be to look for end users within the existing committee as candidates for Bill's replacement.

## **TC on SCE**

TC Chairman Dean Cox provided the update. The next TC meeting will be held in San Diego 14-16 March, 2012. Dean's team will be soliciting input for the NFPA 1975 Standard. There is potential interest in broadening the scope of NFPA 1975. Dean also informed the committee that the Contaminated Water Standard will be dovetailed in the upcoming revision to NFPA's Standards Process, which will put it into the 2014 cycle.

Dean expressed his committees' continued interest in the development of an NFPA performance standard for SCUBA devices. The committee believes that this standard would be best developed within the Respiratory Protection Equipment TC. Dan Rossos, the Chairman of the RPE TC agreed to discuss this opportunity with his committee

## **TC on WFF**

Chairman Swan provided the update. Rick reported that TIAs will be processed for several issues pertaining to NFPA 1977.

Rick shared a Power Point Presentation (copy attached to these minutes) pertaining to work that a consortium of stakeholder participants are supporting regarding wild land firefighting operational requirements and garment needs. Rick felt that this work may well provide a data-based direction for future NFPA 1975 & 1977 work. Rich Duffy offered information about NIST's ember generating apparatus, AKA "The Dragon", as something that might be of interest to this team.

Rick also mentioned that the new direction from NFPA's Standards Council is to combine the development of SCAM documents over several product categories, rather than having a separate SCAM document for each product category.

## **TC on HAZ**

Chairperson Christina Baxter provided the TC update. She informed the committee that NFPA 1992 & NFPA 1994 are moving forward, however, regarding NFPA 1991, the committee was continuing to address the issue of "cumulative vs. breakthrough" test methods. She said the TC was "split" on this issue

## **MOTION BY GRACE STULL, SECOND BY PAT GLEASON**

The TCC directs that NFPA 1991 be returned to the TC for further work and that the standard remain at the comments stage. The TCC also directs that the NFPA Staff Liaison and the TC Committee Chair provide a letter to the NFPA Standards Administration advising them of this direction and that they request expedited action in the form of a shortened cycle.

## **MOTION CARRIED**

## **TC on RPE**

Chairman Rossos reported that the TC had met in Missoula on 19-21 July 2011 with the primary objective of completing the ROPs for NFPA 1981, NFPA 1852 and NFPA 1989. Significant issues include, SCBA "Buddy Breathers" EBSS, thermal requirements for SCBA lenses, SCBA EOSTI activation pressures, and SCBA communications.

Regarding EBSS, Dan reported that NIOSH intends to rescind its position on "buddy breathers" for structural firefighting only. This provides the opportunity for the TC to develop standards requirements for EBSS.

Regarding SCBA EOSTI, Dan highlighted the significant change to the EOSTI activation pressure, 33%, plus 5%, minus zero %. There was discussion regarding the EOSTI requirements in NIOSH's 42CFR PART 84 regulations. Chairman Haskell reported that NIOSH intends to interpret the current requirement to be "a minimum of 25%", which would allow for the proposed NFPA 33% EOSTI activation pressure.

Dan informed the group that the TC continues its work in four primary TGs:

SCBA Mask Lens Issues  
Buddy Breathers  
SCBA Communications  
Reformatting NFPA 1981

The next RPE TC Meeting is scheduled for 13-14 December 2011 in Ft. Lauderdale.

**MOTION BY RICH DUFFY, SECOND BY JEFF STULL**

To re-open the ROP for NFPA 1981 for additional TCC notes

**MOTION CARRIED**

**MOTION BY RICH DUFFY, SECOND BY PAT GLEASON**

The TCC directs the TC to address requirements for the interoperability of EBSS.

**MOTION CARRIED**

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**Agenda Item 17: Old Business**

There was committee discussion regarding the timing of standards and the capacity issues that can occur with test laboratories. We agreed to devote agenda time at the February TCC meeting to explore potential alternatives regarding the timing of new standards. We also discussed the issue of "grandfathering" as it pertains to the time period that products may be marked as compliant to a previous edition of a standard when a new standard is issued

**MOTION BY JEFF STULL, SECOND BY RICH DUFFY**

That the TCC not make any changes to the current policy of an eight month "grandfathering" period for marking products as compliant to a previous edition of a standard with the release of a new edition.

**MOTION CARRIED**

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**Agenda Item 18: New Business**

Overhaul Hazards. Dan Rossos provided an introduction regarding the danger that firefighters face in dealing with hazardous atmospheres that may not be IDLH, as is found in overhaul, and other operations. Dan introduced Grant Coffee, who presented a Power Point Presentation (copy attached to these meeting minutes).

After Grant's presentation, Staff Liaison Trebisacci agreed to pass on the information to the NFPA 1500 Committee as well.

**MOTION BY DAN ROSSOS, SECOND BY RICK SWAN**

The TCC will form a Task Group to explore the issue of post fire exposure to hazardous materials and make recommendations to the TCC.

**MOTION CARRIED**

Chairman Haskell appointed the following TG members:

Dan Rossos – Chairman  
Bruce Varner  
Anthony Putorti  
Rick Swan

Under New Business we agreed to further discuss the following issues at the February TCC meeting:

1. We will further discuss the consolidation of SCAM documents under this project. Staff Liaison Trebisacci will solicit recommendations from each TC
2. Dave Trebisacci explained that Task Group assignments are intended to be for the duration of a standards cycle. He would like to review currently standing TGs in that light at our next meeting.

Dan Rossos asked for direction regarding the Component Recognition TG. Recognizing that the NFPA Standards Council had issued a position on this topic, Dan asked if this TG should continue their work. Staff Liaison Trebisacci agreed to discuss this matter further with Amy Cronin and advised Dan to put the Components Recognition TG's work "on hold" pending the result of that discussion.

Jeff Stull reported to the TCC that he was submitting a number of NITMAM on NFPA 1971, indicating that he believed that several new test methods being introduced for gloves and footwear had not been properly validated. He further described that detailed test data were requested and were not provided to the Technical Committee on Structural and Proximity Firefighting Protective Clothing and Equipment at the time of their ROC meeting, and that these data were only then made available to the TCC during their review of the NFPA 1971 ROC as a result of an invited presentation. He pointed out that the TCC issued notes on the NFPA 1971 ROC requesting that the committee undertake interlaboratory testing and field validation studies to support the introduction of the new methods. However, while it appeared that interlaboratory testing might be initiated, it was not conducted. Jeff stated that he later learned that testing involving some of the laboratories identified the need for the changes in the test methods and that it was possible that these changes could affect the criteria that were implemented as part of the new requirements in NFPA 1971.

Rich Duffy reviewed the procedure for selecting AFG and SAFER Grants. He mentioned that applications from career departments are peer reviewed by career representatives and that volunteer applications are peer reviewed by representatives from the volunteer segment.

The TCC tentatively established our next two meeting dates: 6-8 February 2012 at a location to be determined and 10-12 June 2012 in the Las Vegas area.

Having no further business, the Chairman sought a motion to adjourn.

**MOTION BY DEAN COX, SECOND BY PAT GLEASON**

**To Adjourn**

**MOTION CARRIED**

Acting Chairman Haskell adjourned the meeting at the close of business on 12 October 2011.

Respectfully submitted,

Eric J. Beck, Secretary  
TCC on FESPCE



# FIRE SERVICE PPE RESEARCH PLANNING



12 October 2011  
Baltimore, MD



# FIRE SERVICE PPE RESEARCH PLANNING

## AGENDA

1) Review of Completed Research Projects

2) Review of Current Research Initiatives

3) Review of Research Needs



# 1) Review of Completed Research Projects

## Reminder: Role of the Foundation

- Plan, manage and communicate research in support of the NFPA mission
- Independent charitable organization
  - Formed by NFPA in 1982
  - Intended to provide data to support the needs of NFPA codes & standards
  - Research funds come primarily from:
    - Private and public sector consortia
    - Grants and government sources (e.g. DHS S&T, DOD, FEMA AFG, NIOSH, NIST, NSF, etc)
    - Multiple other sources





# 1) Review of Completed Research Projects

## Previous PPE Project Research Planning

- Ad-hoc Task Group Meeting in PA, May 2008
  - Reviewed research needs
  - Generated a prioritized list of 10 general areas requiring research
- TCC Meeting in GA, Oct 2009
  - Reviewed research needs from May 2008 meeting
  - Clarified list and separated into topic areas
- TCC Meeting in OK, Feb 2010





# 1) Review of Completed Research Projects

## Previous PPE Project Research Planning

### A. Needs Related to Baseline PPE Performance

- 1) Fire/Chemical Environment Characterization
- 2) Field Study of Deployed Equipment
- 3) Fire Service PPE Needs Assessment

### B. Needs Related to Electronic Equipment

- 1) Performance Criteria for Data & Voice Telemetry
- 2) Define Parameters for FF Location Monitoring
- 3) Establish Electronics Integration Platform
- 4) Establish Physiological Monitoring Protocol

### C. On-Going Needs

- 1) New Materials and Technologies Development
- 2) Improve PPE Ergonomics
- 3) Research Agenda Clearing House





# 1) Review of Completed Research Projects

## Update of Recently Completed (or Pending) PPE Studies

- Respiratory Exposure Study
- Thermal Capacity of Fire Fighter Protective Clothing
- Risk Factors for FF Cardiovascular Disease (UArizona)
- Whole Glove Testing Technologies to Advance Perf. Standards for Structural Firefighting Gloves (NCSU)
- Image Quality Testing of Fire Service Thermal Imagers

(Completed Reports available at:  
[www.nfpa.org/foundation](http://www.nfpa.org/foundation))





# FIRE SERVICE PPE RESEARCH PLANNING

## AGENDA

1) Review of Completed Research Projects

2) Review of Current Research Initiatives

3) Review of Research Needs



## 2) Review of Current Research Initiatives

### Two Projects Related to PPE

- A. “Evaluation and Enhancement of Fire Fighter PASS Effectiveness”... Next Generation PASS Technology
- B. “Performance Requirements for Compatible and Interoperable Electronic Equipment for Emergency First Responders”... Fire Fighter Electronic Equipment Platform





## Next Generation of PASS Technology

# Project Highlights

### Purpose and Approach

- Improve safety of structural FFs and aid rescue of distressed FFs, through evaluation and enhancement of widely used PASS technology, by:
  - Providing scientific basis for optimum PASS alarm signal (for use by NFPA 1982, *Standard on Personal Alert Safety Systems*)
  - Investigating feasibility of practical enhancements
- Project led by Fire Protection Research Foundation, with research team from University of Texas – Austin and NIST

### Fire Service Partners

- Metro Chiefs
- NFPA Fire Service Section
- NVFC
- Austin FD (TX)
- Glendale FD (AZ)
- Portland Fire/Rescue (OR)



## Next Generation of PASS Technology

# Project Tasks and Timeline

- 1) Administrate Project Advisory Panel (1-36 months)
- 2) Literature Review (2-5 months)
- 3) Portfolio of Fire Ground Noise (6-12 months)
- 4) Analysis of Existing PASS Alarm Sounds (13-15 months)
- 5) Modeling and Validation of Sound Transmissions (2-30 months)
- 6) Evaluation of FF Response to PASS Signal (16-34 months)
- 7) Recommendations for Readily Implemented Alternative Technology (30-34 months)
- 8) Reporting and Dissemination (34-36 months)





## Next Generation of PASS Technology

# Projected Results

- Project Deliverables will include:
  - Literature search
  - Digital portfolio of fire ground noise
  - Analysis of existing PASS alarm sounds
  - Models of sound transmissions applicable to PASS
  - Evaluation of FF response to PASS signals
  - Recommendations for practical and readily implemented alternative technologies. For example:
    - » Investigate acoustic directive receivers (one way);
    - » Assess detectability enhancement technology; and
    - » Review addressable non-audible frequencies.





## Next Generation of PASS Technology

# Implications for Practice

- Establish a scientific basis for the optimum PASS alarm signal. This will:
  - allow NFPA 1982 to require the best possible standardized signal
  - Provide a basis for a single universal PASS signal
  - Enable marketplace to further develop technology using scientifically-established baseline
- Produce a methodology for fire ground noise and optimized audible signals that can be applied to other research areas (e.g. FF hearing loss)
- Recommend practical and readily implemented alternative technologies





# Fire Fighter Electronic Equipment Platform

## Project Highlights

### Purpose and Approach

- Develop performance requirements for the compatibility and interoperability of electronic equipment used by emergency first responders, by:
  - Developing an inventory of existing and emerging electronic equipment categorized by key area of interest.
  - Document equipment performance requirements relevant to interoperability (e.g., communications, power supply, etc)
  - Develop an action plan toward the development of requirements to meet the needs of emergency responders.
- Project led by Fire Protection Research Foundation



Project  
Funded by:

**NIST**



## Fire Fighter Electronic Equipment Platform

# Project Tasks and Timeline

- 1) Administrate Project Advisory Panel (1-24 months)
- 2) Literature Review
- 3) PPE Electronic Equipment Inventory
- 4) Performance Requirements for Interoperability
- 5) Workshop
- 6) Reporting and Dissemination





# FIRE SERVICE PPE RESEARCH PLANNING

## AGENDA

- 1) Review of Completed Research Projects
- 2) Review of Current Research Initiatives
- 3) Review of Research Needs



## 3) Review of Research Needs

### Current Topics Related to PPE

- SCBA Face Piece Thermal Characteristics
- Sizing for Women
- PPE for Electrical Disconnect (e.g., EV's)
- Other???
- Possible Code Fund Topics:
  - Cleaning and disinfecting PPE
  - Ten year shelf life
  - Glove field evaluation
  - Wicker test related to heat resistance of materials





## Contact Information:

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# PERSONAL PROTECTIVE EQUIPMENT DEVELOPMENT PROJECT

WILDLAND

# Program Objectives

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- ▶ Develop a NFPA 1977 and 1975 certified Wildland Fire Fighting PPE Garment System that improves user operational performance by:
  - ▶ Improving radiant thermal protection.
  - ▶ Reducing heat stress.
  - ▶ Improving form, fit and function.
- ▶ CAL FIRE preformed a selection process to identify what to protect their FF's from.



# Participants

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- ▶ NATICK National Protection Center (NPC), U.S. Army Natick Research, Development & Engineering Center
  - ▶ Department of Homeland Security, Science and Technology Directorate (DHS S&T)
  - ▶ CAL FIRE
  - ▶ U.S. Forest Service, Missoula Technology and Development Center
  - ▶ Local Government Fire Departments – Heat Illness Working Group
    - ▶ Ventura County, Los Angeles County, Los Angeles City, Santa Barbara County, Kern County, Los Angeles City, Orange County, San Bernardino County, San Diego City, Pasadena City, Chino Valley and Marin County
  - ▶ North Carolina State University
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# Program Approach

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- ▶ Apply the Advanced Personal Protection System (APPS) process to:
- ▶ Define PPE operational requirements.
- ▶ Conduct testing to validate material performance.
- ▶ Develop a PPE garment system configuration.
- ▶ Conduct operation evaluations to validate operational suitability & effectiveness of PPE.
- ▶ Develop a NFPA 1977 and 1975 certified PPE specification package for production.



# Program Funding

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## ▶ DHS S&T

- ▶ Funds are remaining balance from APPS
- ▶ Program is resource constrained. Seeking additional funding source.
- ▶ Resources are applicable to:
  - ▶ Test & evaluation of materials and garments.
  - ▶ Procurement & fabrication of test articles.
  - ▶ NFPA 1977 and 1975 certification of PPE
  - ▶ Contractor Support
  - ▶ IPT Travel
  - ▶ NPC program management



# Uniform Material Selection

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- ▶ **Critical Performance Parameters**
  - ▶ RPP 10
  - ▶ THL 500
  - ▶ NFPA 1977 & 1975 certification
- ▶ **Other Considerations**
  - ▶ Material cost
  - ▶ Comfort (air perm, wicking, etc.)
  - ▶ Durability (abrasion, strength, etc.)



# Garment Configuration

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- ▶ Develop a single layer dual use (station wear & PPE) NFPA 1977 & 1975 certified garment system
- ▶ Develop a new NFPA 1977 certified dual layer over-garment to replace existing response shirt / jacket & pants.
- ▶ Undergarments included as a system ensemble.



# Conclusion

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- ▶ The Fabric Manufactures have produced modern fabrics to improve performance.
- ▶ Current technology is old.
- ▶ New Paradigm of the study is to test the Firefighter in the product and not the product that goes onto the Firefighter.

