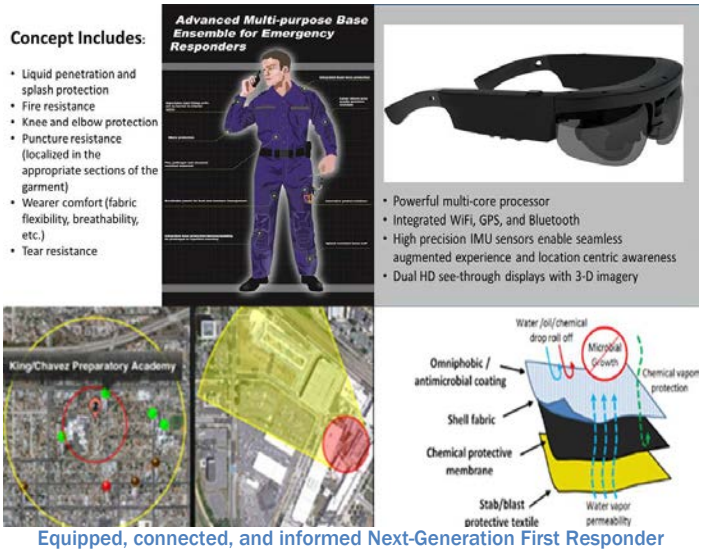
DHS Science and Technology Directorate

Apex: Next Generation First Responder (NGFR)

Impact and Vision

The NGFR Apex will integrate plug-and-play personal protective equipment (PPE) and tools providing multi-layer threat protection and up-to-the-moment situational awareness to first responders. The vision includes embedding advanced information-delivery tools—riding on next generation communications pathways—that are adaptable across disciplines and operational environments. These personal protective equipment (PPE) systems are ruggedized to provide fire resistance, liquid penetration and splash protection, puncture resistance and improved usability and comfort.

Responders today still rely on radio communications and PPE with insufficient threat protection. With enhanced protection and timely, actionable information, responders of the future will operate more safely and effectively.



Equipped, connected, and informed Next-Generation First Responder

Apex Project Description

The NGFR Apex program better protects on-scene first responders in two ways. First, it provides real-time situation awareness that enables responders to recognize and avoid hazards—before, during and after incidents. This awareness is to be achieved via wearable computing devices seamlessly integrated into the PPE to fully connect responders with a rich information infrastructure and sophisticated analytical and visual capabilities. Second, through advanced material science, this program enables responders to withstand threats they cannot avoid—resulting in fewer fatalities and injuries.

Approach

The NGFR approach leverages the best of existing and emerging technologies and integrates them into a system that both meets responder needs and operates within on-scene environmental constraints. The program is challenged to maximize PPE protection, enhance comfort and durability and consider other important human factors engineering principles. Hardware components of NGFR program solutions will be ruggedized and miniaturized, as needed—allowing responders to receive, retrieve and display diverse data types.

Customer Priority

S&T bases this Apex program on the findings of *Project Responder 4: 2014 National Technology Plan for Emergency Response to Catastrophic Incidents*. Project Responder 4 is the result of focus groups involving more than 250 federal, state and local emergency responders, as well as responder associations and technical subject matter experts from industry, academia and the National Laboratories. S&T knows that a diversity of voices ensures recommended solutions are achievable and reflect operational considerations.

Notional Timelines

- PPE
  - Define performance criteria / identify testing requirements (FY15)
  - Complete initial testing to finalize materials (FY15)
  - Receive 300 prototype garments from two developers (FY16)
  - Extended operational field assessments / down select (FY17)
- Hardware / Communications
  - Use of smart phone / WiFi / 4G (FY15)
  - Prototype wearable technology / MANET / LTE (FY16-17)
  - Wearable technology/FirstNet (FY17-19+)
- Software / Interface
  - Rudimentary SA display, static layers (FY15)
  - Enhanced display, dynamic “push” data, prototype voice commands (FY16-17)
  - Fully-aware hands free display, dynamic data, voice activated (FY18-19)
- Data
  - Basic incident data, limited static data sources (FY15)
  - Real-time tracking of incidents, units, enhanced preloading of data (FY16-17)
  - Full two-way data sharing (FY18-19)

Homeland Security
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To learn more about the Next Generation First Responder Apex project, contact SandTFRG@dhs.gov

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