Emergency Management of Tomorrow Research: Emergency Operations Center of the Future Tabletop Exercise

Nashua, NH Tabletop Exercise

June 2024

Science and Technology

This report was prepared for the U.S. Department of Homeland Security under a Work-for-Others Agreement with the U.S. Department of Energy, contract DE-AC05-76RL01830, IA 70RSAT23KPM000025.

Pacific Northwest
NATIONAL LABORATORY

PNNL-36059

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Nashua, NH Tabletop Exercise

June 2024

Nick Betzsold
Jon Barr
Samuel Ortega
Chelsea Sleiman
Maren Disney
Grant Tietje

U.S. DEPARTMENT OF ENERGY

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Pacific Northwest National Laboratory
Richland, Washington 99354

Acknowledgments

The Pacific Northwest National Laboratory team would like to acknowledge appreciation for this work funded through the Department of Homeland Security Science and Technology Directorate. Additionally, the many participants of the tabletop exercises provided exceptional insights in evaluating the potential impacts of emerging technologies on Emergency Operations Center of the Future concepts. In particular, the PNNL team would like to acknowledge Emergency Management Director Emily Martuscello and the Dartmouth Hitchcock Clinics for hosting this Emergency Management of Tomorrow Research tabletop exercise. We also appreciate the engagement from the many emergency management and public safety organizations that participated and provided critical insights and perspectives to this project.

Acronyms and Abbreviations

AI	Artificial Intelligence
DHS S&T	Department of Homeland Security Science and Technology Directorate
EM	Emergency Management
EMOTR	Emergency Management of Tomorrow Research
EOC	Emergency Operations Center
PNNL	Pacific Northwest National Laboratory
R&D	Research and Development
TTX	Tabletop Exercise

Contents

Figures

Tables

1.0 Introduction and Objectives

As part of the Emergency Management (EM) of Tomorrow Research (EMOTR) program, sponsored by the Department of Homeland Security (DHS) Science and Technology (S&T) Directorate, Pacific Northwest National Laboratory (PNNL) developed concepts for the Emergency Operations Center (EOC) of the Future to provide recommendations to assist DHS S&T in future decision-making with regards to research and development (R&D) and investments toward establishing a framework for a national, coordinated approach to EM. PNNL is conducting tabletop exercises (TTXs) designed to assess the impacts and benefits of emerging technologies on EM organizations.

Table 1 summarizes the expected outcomes of each TTX.

Table 1. Exercise Objectives

Exercise Objectives
Identify technologies that could improve EOC response operations.
List efficiencies gained and performance enhancements in EOC operations through use of identified technologies.
Discuss limitations, concerns, and mitigation strategies for identified technologies.
Review how to implement identified technologies.

This report summarizes the second of three TTXs held at Dartmouth Hitchcock Clinics in Nashua, New Hampshire, on April 10, 2024 (Figure 1).

Figure 1. Participants at the EMOTR tabletop exercise in Nashua, NH.

2.0 Methodology

This section describes in general terms who participated, what was discussed, and how the TTX was executed.

2.1 Participation

Figure 2. PNNL EMOTR task leads engage in discussion with TTX participants.

Each TTX brought together emergency managers and first responders with diverse backgrounds; federal, state, and local EOC stakeholders; and academic researchers. Participants were not expected to solve the problems presented in the TTX scenario. Instead, the exercises jump-started discussions about the technologies, data inputs, tasks, coordination, outputs, and gaps between the current and desired states. Participants were coached to keep discussions broad and focused on the impacts of technology on a given scenario.

2.2 Approach

The TTXs are designed to be sequential, spanning a variety of EM organization sizes and population densities. This second TTX, held in Nashua, NH, focused on human-machine teaming and how the most useful emerging technologies and tools can be optimized for maximum EM function effectiveness. Against this backdrop, a futuristic severe pandemic emergency scenario and adversarial artificial intelligence (AI) complication were used to facilitate the TTX. For more details regarding the TTX scenario and facilitation, please see Appendix A – Situation Manual.

2.3 Format

Approximately 20 total participants were invited to attend the TTX, which was executed as a half-day, café-style workshop. A high-level agenda is provided in Table 2. New for this TTX was the implementation of a Mural whiteboard for collaboration and brainstorming.[1]

Table 2. Nashua, NH TTX Agenda

Time	Activity
0930	Arrival and Check-In
0940	Welcome and Opening Remarks
0950	PNNL/EMOTR Overview and Player Introductions
1020	EOC of the Future Tabletop Objectives
1030	Technology Overview

[1] https://app.mural.co/t/innovationfoundry9281/m/innovationfoundry9281/1712753105370/085d580fd9bbe0d0c3114397203362ff60deab9f?sender=ffa20ea9-6d98-495e-bb89-3068a1e82071

1100	Exercise Parameters
1115	Module One
1245	End Module One
	Lunch
1345	Module Two
1415	Closeout
1430	Adjourn

The accompanying slide deck used for facilitation can be found in Appendix B – Slides.

3.0 Key Insights

Key insights resulting from this TTX are organized into outcomes from the discussions and participant feedback.

3.1 Discussion Outcomes

Key discussion points include the following?

- Relevant tasks and functions include data collection, developing incident action plans, training units, updating distribution/inventory/contact lists, staffing, situational awareness, communications, verifying/deconflicting information, resource allocation, action prioritization, handling constantly evolving requirements, and managing cascading impacts.
- A Situational Awareness Virtual Assistant (“Sit Bot”) maintains a continuous common operating picture, personalized to individuals, understands that not everyone is up to date at all times, and can also be used during steady-state operations (not just in an emergency).
- Maintaining accurate contacts, staffing, etc. is a byproduct of a more foundational data management capability. What will these information sharing systems touch? Who will have access and to how much?
- Situational awareness functions include searching, monitoring, filtering, collecting, parsing, integrating, aggregating, disseminating, classifying, etc.
- Misinformation and disinformation are such difficult challenges because of the varying levels of malicious intent behind each one. Where the information is originating from, who the information is targeting, and why, are all useful factors for contextual understanding.
- Messaging should convey a single, common idea that is delivered in the most tailored way for each distinct audience.
- Virtual EOCs must also work for personnel who may have asymmetric levels of virtual capabilities.
- Dedicated EOCs are essentially wasted space when personnel are not actively managing emergencies (which is most of the time). This creates the need for an “EOC in a box,” where the various concepts and technologies that are needed to respond to a given emergency are easily deployable and quickly available when needed.
- Tasks should be evaluated and prioritized for automation or AI based on value added to EOC operations, not simply because they can be automated or aided by AI.

- Tools such as AI should support merit-based processes and outcomes.

Additionally, the TTX discussions evaluated the potential impacts of emerging technologies on emergency operations, summarized in Figure 3. For each technology idea, the table summarizes the advantages, disadvantages, implementation considerations, and which EOC of the Future concept it addresses. For more information on EOC of the Future concepts, see the EOC of the Future Concepts and Recommendations report available by request to emotr@pnnl.gov.[1]

Figure 3. PNNL contractor Grant Tietje briefs tabletop participants on the scenario.

3.2 Feedback

All feedback respondents said the TTX was “very much so” an effective use of time and 100 percent indicated they would attend another PNNL-facilitated tabletop exercise. In general, this group was very engaged and more receptive and positive regarding AI and emerging technologies than the first TTX, held in Madison, WI.

Use of the collaborative tool Mural was a big hit with this group—it was a great last-minute addition to the facilitation plan. It was suggested to shorten the upfront portion (PNNL, EMOTR, and technology briefings) so that the group could get to the scenarios and discussion faster. This group had to be cut off in the discussions in order to keep the agenda moving, which was different from Madison. Feedback was consistent with Madison participants to weave technology demonstrations into the later discussions, so that will be accounted for in the final TTX.

A compiled feedback form can be found in Appendix C – Participant Feedback.

4.0 Next Steps

This second TTX built on the success of the first. In particular, the facilitation this time focused the discussion on specific EM tasks that could be addressed by emerging technologies. This group was great at discussing the potential implementation requirements and considerations. For the final TTX, Mural will be utilized again, given the success in Nashua. More facilitation format changes will be made to shorten the initial overviews and provide more time for scenario discussions and technology demonstrations. The discussion will also be directed toward emerging technologies and EOC of the Future concepts that have not received as much attention in the first two TTXs.

[1] Betzsold, N., Barr, J., Lesperance, A., Bartholomew, R., Ortega, S., Sleiman, C., Disney, M., Tietje, G. (2024). “Emergency Management of Tomorrow Research – Emergency Operations Center of the Future Recommendations Report.” Pacific Northwest National Laboratory.

Table 3. Nashua, NH TTX Outcomes

Technology Ideas	Advantages	Disadvantages	Implementation	EOC of the Future Concept(s) Addressed
(Personalized) "Sit Bot": virtual situational awareness bot	Always up to date for end user Provides status for all end-user needs	Information asymmetry (not everyone is up to date at all times) Privacy and security Susceptible to data manipulation	Tailor information for specific groups Know who is up to date Validate info being disseminated (need multiple sources of data) Control need to know; bot proposes but human is gatekeeper Support steady state and incidents	Continuous, real-time situational awareness AI automation and human-machine teaming Human-centered design of workspaces Resilient system design
AI – productivity tools	Updated contact lists Staffing and scheduling management Backbone for other systems and capabilities		Roles updated; preferences for communications modalities, interests, and styles are integrated Public and private data sources	Next-generation data management Continuous, real-time situational awareness AI automation and human-machine teaming Whole community approach
Drones – situational awareness tool	Agile sensor input Provide data validation Increased reach and efficiency		Access control/user authentication Public and private drones working together	Continuous, real-time situational awareness Hybrid EOC operations Whole community approach

	Ensure critical routes remain open			
AI – misinformation protection	Sentiment analysis Transcribe core messages into various modalities	How to identify misinformation?	What needs to be verified? What should be stated officially? Identify difference between malicious intent and emerging information How is the public reacting? How is messaging propagating?	AI automation and human-machine teaming Human-centered design of workspaces Whole community approach
Regulatory compliance assistance	Maintain regulatory compliance at all times Deconflict understandings of the regulation Version control	Entangling alliance problems when multiple jurisdictions are utilizing agreements all at once	Be aware of pre- and post-incident Differentiate what is applicable to each organization Flag what works or doesn't work in real time Task agnostic	Next-generation data management Continuous, real-time situational awareness AI automation and human-machine teaming Hybrid EOC operations
Decision support tool	Identify, map, and relate decision points Build briefings for executive decision-makers Predict recovery paths	Cascading impacts Get buy-in from executives Unknown alternatives	Understand cascading impacts for operations and decision-makers Log decision-making process Redundancy	Continuous, real-time situational awareness Human-centered design of workspaces Resilient system design
Knowledge management tool	Leverage historical data Remember and utilize lessons learned		Translate into continuous improvement, after-action reporting Curated based on individual needs	Next-generation data management Continuous, real-time situational awareness Human-centered design of workspaces

Real virtual EOC	Simple and intuitive What is needed is customizable for the need and moment	Who is 1st, 2nd, 3rd available to talk and ensure information is available? Work with asymmetric levels of virtual capabilities EOC in a box	AI automation and human-machine teaming Human-centered design of workspaces Hybrid EOC operations Resilient system design

Appendix A – Situation Manual

Global Pandemic 2030

Situation Manual

April 10, 2024

This Situation Manual (SitMan) provides participants with all the necessary tools for their roles in the exercise. Some material is intended for the exclusive use of exercise planners, facilitators, and evaluators, but players may view other materials that are necessary to their performance.

Table of Contents

OVERVIEW

Name	Global Pandemic 2030
Dates	April 10, 2024
Scope	4 Hours at Dartmouth Hitchcock Medical Center - 2300 Southwood Drive, Nashua NH 03063
Mission Area(s)	Response
Objectives	See page 2
Threat or Hazard	Global Pandemic and Cyberattack
Scenario	The next global pandemic has struck. In addition, the comprehensive set of Internet-of-Things tech and AI tools has provided malicious actors a larger attack surface for adversarial AI and cyberattacks. At the height of the first wave of hospitalizations, a domestic terrorist group has launched an Internet-of-Things cyberattack and is covertly compromising healthcare systems, manipulating data, and sabotaging life-saving equipment.
Sponsor	Department of Homeland Security, Pacific Northwest National Laboratory, and Wisconsin Emergency Management
Participating Organizations	Players (mix of local, state, federal) representing emergency management, law enforcement, fire department, emergency medical services, utilities, transportation, communications, public health, healthcare, Federal Bureau of Investigation, cyber response, and National Guard
Point of Contact	Nick Betzsold Data Scientist Pacific Northwest National Laboratory nicholas.betzsold@pnnl.gov | (509) 375-4583

GENERAL INFORMATION

Objectives

The following objectives in Table 1 describe the expected outcomes for the exercise.

Exercise Objectives
Identify technologies that could improve EOC response operations
List efficiencies gained and performance enhancements in EOC operations through use of identified technologies
Discuss limitations, concerns, and mitigation strategies for identified technologies
Review how to implement identified technologies

Table 1. Exercise Objectives

The exercise schedule is in Appendix A.

Participant Roles and Responsibilities

The term *participant* encompasses many groups of people, not just those playing in the exercise. Groups of participants involved in the exercise (Appendix B), and their respective roles and responsibilities, are as follows:

Players- Players are personnel who have an active role in discussing or performing their regular roles and responsibilities during the exercise. Players discuss or initiate actions in response to the simulated emergency. Players will also identify and/or discuss the ways new technology could be brought to bear in their roles and what challenges they would anticipate with technology adoption.

Observers- Observers do not directly participate in the exercise. However, they may support the development of player responses to the situation during the discussion by asking relevant questions or providing subject matter expertise.

Facilitators- Facilitators provide situation updates and moderate discussions. They also provide additional information or resolve questions as required. Key Exercise Planning Team members also may assist with facilitation as subject matter experts (SMEs) during the exercise.

Structure

This exercise will be a multimedia, facilitated activity. Players will participate in the following two scenario modules:

Module 1: Pandemic Response Plan

Module 2: Hospitalization Surge and Cyberattack

Each module begins with an audio update that summarizes key events occurring within that time period.

The facilitator will guide participants through a brief discussion period, developed using the scenario modules, to describe their actions, decisions, and concerns from the perspective of

personnel assigned to an emergency operations center. Players are encouraged to ask questions of other players. Throughout the discussion period, the facilitator will highlight current and possible future technologies for participants to evaluate for use in an emergency operations center during response. Players are encouraged to present other technological solutions as well as suggest ideas for future research.

Guidelines

- This exercise will be held in an open, low-stress, no-fault environment. Varying viewpoints, even disagreements, are expected.
- Respond to the scenario using your experience, knowledge of current plans and capabilities (i.e., you may use only existing assets), and insights derived from your training and experience.
- Decisions are not precedent setting and may not reflect your organization's final position on a given issue. This is an opportunity to discuss technologies that may improve EOC operations.
- Issue identification is not as valuable as player evaluations of proposed technology provided by the facilitator that could improve response efforts. Creative, and even disruptive, ideas about technology and tools should be the focus.
- Assume there will be cooperation and support from other responders and agencies.
- The basis for discussion consists of the scenario narrative and modules, your experience, your understanding of relevant plans, your intuition, and information about technology provided by the facilitators and that you bring with you to the exercise.
- Treat the scenario as if it will affect your area.

Assumptions and Artificialities

In any exercise, assumptions and artificialities may be necessary to complete play in the time allotted and/or account for logistical limitations. Participants should accept that assumptions and artificialities are inherent and should not allow these considerations to negatively impact their participation. During this exercise, the following apply:

- The activity is conducted in a no-fault learning environment wherein technological solutions to improve response will be discussed.
- The scenario is plausible and events occur as they are presented.
- The scenario is intended to form the basis for discussions about technology, less emphasis will be placed on solving tactical problems presented in the scenario.
- All players receive the same information at the same time.

MODULE 1: PANDEMIC RESPONSE PLAN

Scenario

Friday, November 1st, 2030

"Welcome back to WMUR 9. We have a story that has become a national headline. We want to share with you the impact it may have on us here in Nashua.

We've just received word that a highly contagious virus causing severe human illnesses has been identified in several countries around the world, including the United States, and even right here in Nashua. Saint Joseph Hospital is where the first confirmed case of a mutated strain of H5N1 influenza (H5N1X) in our state was diagnosed. The Centers for Disease Control and Prevention here in the U.S. and the World Health Organization have confirmed there is sustained human-to-human transmission of H5N1X.

The symptoms of H5N1X influenza are similar to typical seasonal influenza with high fever, body aches, and cough, but much is still unknown. Because of this, it is hard for public health officials to determine the transmission rate and for doctors to determine whether patients are infected with seasonal influenza or H5N1X influenza.

There is no denying the uptick in hospitalizations here in the U.S. is unnerving. The Centers for Disease Control and Prevention are reporting that across the country 8 to 10% of the H5N1X influenza cases are hospitalized and 50 to 60% of the hospitalized cases are fatal. The hospitalization rate here in New Hampshire is reported as 8%.

It has been over a decade since the COVID-19 pandemic, but most of the world is still feeling some lingering effects. However, the lessons learned and pandemic response plans developed in the wake of COVID-19 to improve response efforts, protect vulnerable populations, and lessen the impact on the global supply chain are being put into action. Many states, including Washington, Oregon, California, Michigan, Illinois, New York, and New Hampshire have begun preparing for the worst by organizing their laboratory testing capabilities, stocking critical supplies, and training staff for what could possibly be the next global pandemic.

Here in Nashua, connections are already being made between local and state partners. The Department of Health and Human Services has reached out to local emergency managers, hospitals, and other community partners to field questions and develop resource planning."

Key Issues

- This is anticipated to be a hospital surge that will exceed regional response capabilities.
- Human-machine teaming will be highlighted during the exercise.

Questions

The following questions are provided to guide the discussion of proposed technological solutions.

1. What are the most time-consuming activities?
2. What are the challenges/most difficult problems?
3. Which of the proposed technologies provide a solution?
4. How would these proposed technologies be implemented?
5. What benefits does a given proposed technology provide (faster, easier, smarter, time saver, etc.)?
6. Can the solution be applied to other problems?
7. Are there any concerns about the proposed technology, such as safety, cost, or impacts to other systems?

MODULE 2: HOSPITALIZATION SURGE AND CYBERATTACK

Scenario

Friday, November 22nd, 2030

"Thank you for staying connected to WMUR 9 where we have the most recent updates on the 2030 pandemic.

The hospitalization rate has increased to 14% in Hillsborough County alone, and a national rate of 33.8% last week. The case fatality rate is reportedly high, although officials have declined to put a number on it until they have more data. There is no mistaking it at this point – this pandemic can and most likely will have detrimental impacts on our communities and around the globe.

The impacts to the health care system have been profound. Although alerted quickly, health care facilities were hit with an influx of patients, high demands for supplies, and a shortage of healthcare workers almost immediately.

The infection appears to affect the immune system causing it to overreact, called a cytokine storm, leading to a high demand for hospital beds with many patients in need of advanced medical care. Hospitals are already reporting shortages of supplies and critical equipment. The H5N1 vaccine in the Strategic National Stockpile appears to be a poor match for this variant. A new vaccine and an inexpensive diagnostic test are in the early stages of development, but the FDA recently briefed the White House that they still need more time until both will be available for public use.

It's hard to comprehend, but during these challenging times some people find this as an opportunity to use critical infrastructure as a virtual playground for disasters. A domestic terrorist group named "The 37" has unleashed on multiple fronts a cyberattack against the national healthcare community, unfortunately to include Nashua.

Through hospital cloud platforms and other systems, the group has been able to manipulate patient chart information, compromise billing and payroll systems, change medication orders, and remove patients from provider dashboards altogether. The disease surveillance systems tracking cases of H5N1X influenza have also been affected with outbreak and case information being changed or removed. In a shocking and devastating development, reports are being confirmed of life-saving medical equipment such as ventilators being digitally sabotaged, making staff unaware when patients are in need of immediate intervention. Southern New Hampshire Medical Center has reported 8 deaths in the past two days due to life-saving equipment not alerting as expected. We have unconfirmed reports of similar problems with life-saving medical devices in home healthcare settings as well.

Nationally, this cyberattack has hit other hospitals, and government sources speaking off the record have admitted they are not able to keep up with it. "It is a very sophisticated attack in

terms of the number of organizations that have been hit and the complexity of the malware being used. The attackers and their malicious code are adapting quickly to any efforts to stop it." If there is a silver lining, at this time emergency management systems outside of healthcare are secure and have not had similar cyber vulnerabilities exploited.

Officials are recommending that all healthcare providers take immediate steps to protect their systems. Life safety systems such as ventilators and dialysis machines need to be closely monitored while in use. If your organization is hit by the cyberattack, you are directed to report it immediately to authorities. A national web-based reporting system is available at www.cisa.gov/forms/report.

Stay tuned for more information."

Key Issues

- Hospitalization rates continue to increase but available resources are decreasing.
- Health care professionals do not have the tools they need to maintain adequate level of care for their patients.
- IoT medical devices used by doctors to aid in their response efforts are now being manipulated by malicious actors.

Questions

Based on the information provided, participate in the discussion concerning the scenario in Module 2. Use the critical issues, decisions, and requirements involved to assess technologies for improving response in the EOC.

The following questions are provided to guide the discussion of proposed technological solutions.

1. What are the most time-consuming activities?
2. What are the challenges/most difficult problems?
3. Which of the proposed technologies provide a solution?
4. How would these proposed technologies be implemented?
5. What benefits does a given proposed technology provide (faster, easier, smarter, time saver, etc.)?
6. Can the solution be applied to other problems?
7. Are there any concerns about the proposed technology, such as safety, cost, or impacts to other systems?

EXERCISE SCHEDULE

Note: Because this information is updated throughout the exercise planning process, appendices may be developed as stand-alone documents rather than as part of the SitMan.

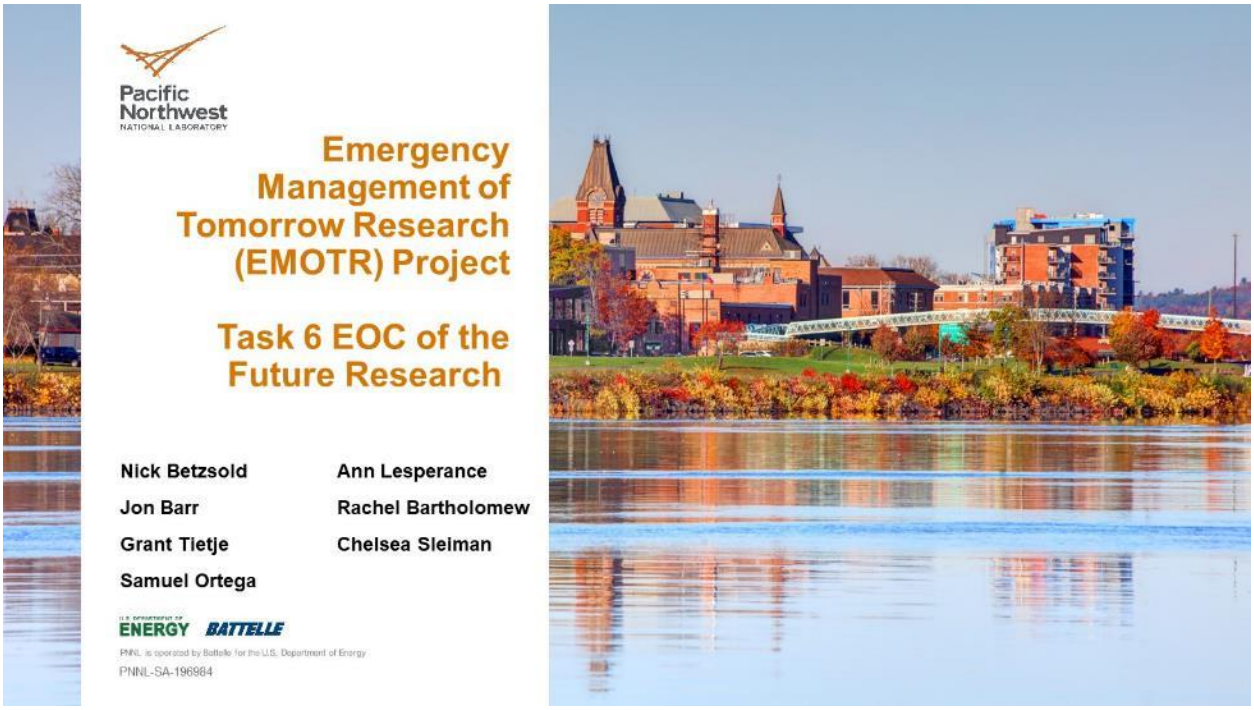
Time	Activity
April 10, 2024	
0930	Arrival and Check-In
0940	Welcome and Opening Remarks – Nashua OEM
0950	PNNL/EMOTR Overview and Player Introductions – PNNL
1020	EOC of the Future Tabletop Objectives – Nick Betzsold (PNNL)
1030	Technology Overview – Jon Barr and Nick Betzsold (PNNL)
1100	Exercise Parameters – Grant Tietje (PNNL)
1115	Module One
1245	End Module One
	Lunch
1345	Module Two
1415	Closeout
1430	Adjourn

ACRONYMS

Acronym	Term
DHS	U.S. Department of Homeland Security
HSEEP	Homeland Security Exercise and Evaluation Program
SitMan	Situation Manual
SME	Subject Matter Expert
TTX	Tabletop Exercise
PNNL	Pacific Northwest National Laboratory

Appendix B – Slides

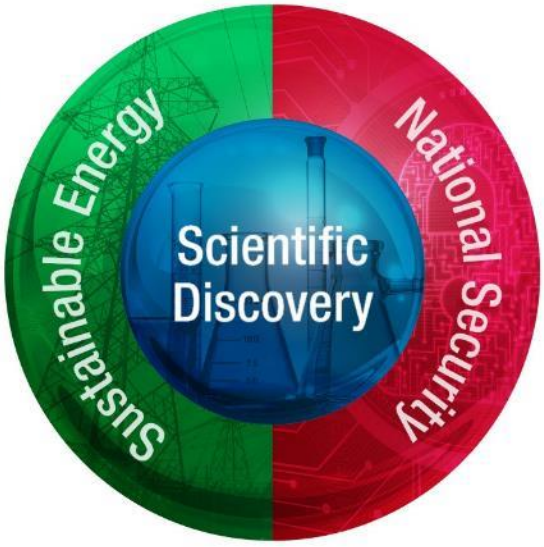
Video: https://www.youtube.com/watch?v=T6ubRoZCeVw



Welcome and Introductions

Pacific Northwest National Laboratory is a U.S. Department of Energy national laboratory **advancing scientific frontiers** and providing solutions to critical national needs

- Established in 1965
- Managed by Battelle Memorial Institute
- 6,100+ staff across the nation
- PNNL also supports the Department of Homeland Security



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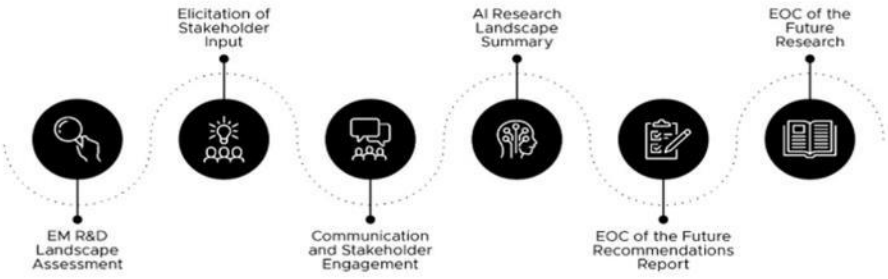
Science and Technology

PNNL is partnering with DHS on the EMOTR program: Connecting existing research and technology **with EM capability needs.**



4

Pacific Northwest NATIONAL LABORATORY

Participant Introductions

What is your favorite tool to use in emergency response?

5

Pacific Northwest NATIONAL LABORATORY

Exercise Objectives

Scope:

- Evaluate potential impacts of new technologies on emergency operations, exploring the Human-Machine Teaming (HMT) concept and how emerging technologies can be optimized for maximum EM function effectiveness.

Objectives:

- Identify technologies that could improve EOC response operations
- List efficiencies gained and performance enhancements in EOC operations through use of identified technologies
- Discuss limitations, concerns, and mitigation strategies for identified technologies
- Review how to implement identified technologies

Ground Rules:

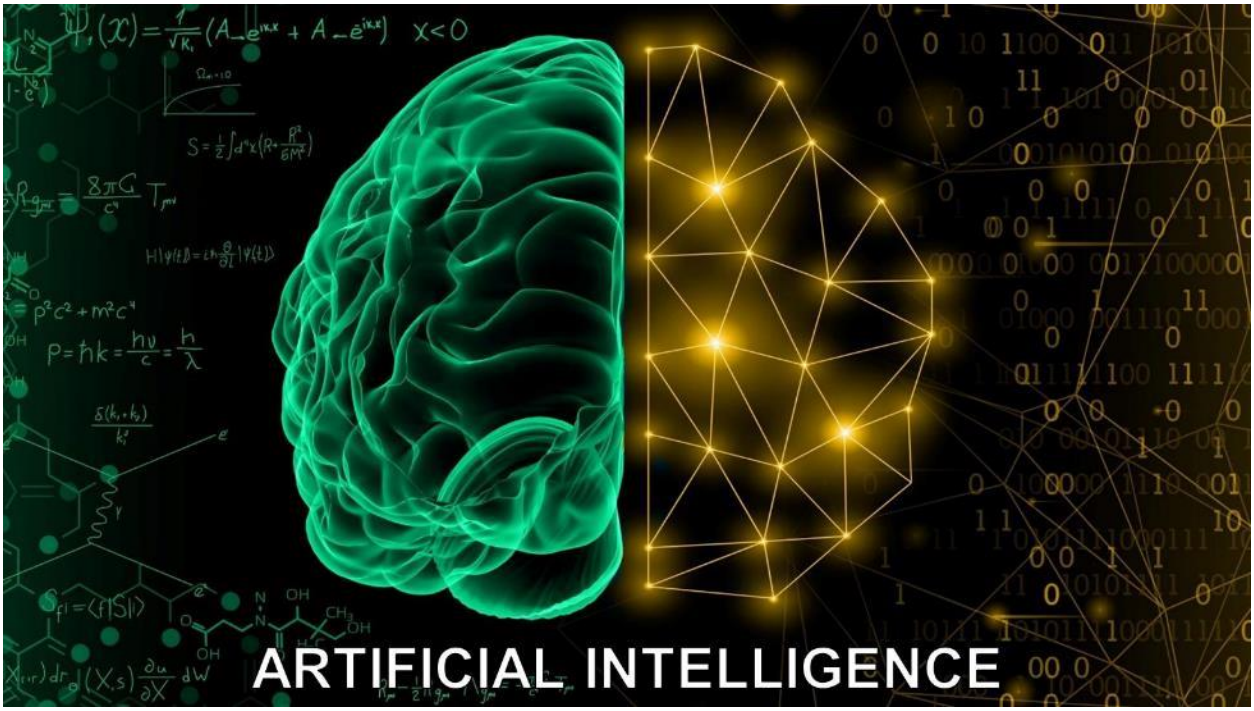
Solving scenario issues is not an objective.

Focus discussion on technology rather than working through procedural actions

We are not evaluating emergency plans

Assume cooperation from responders and agencies

6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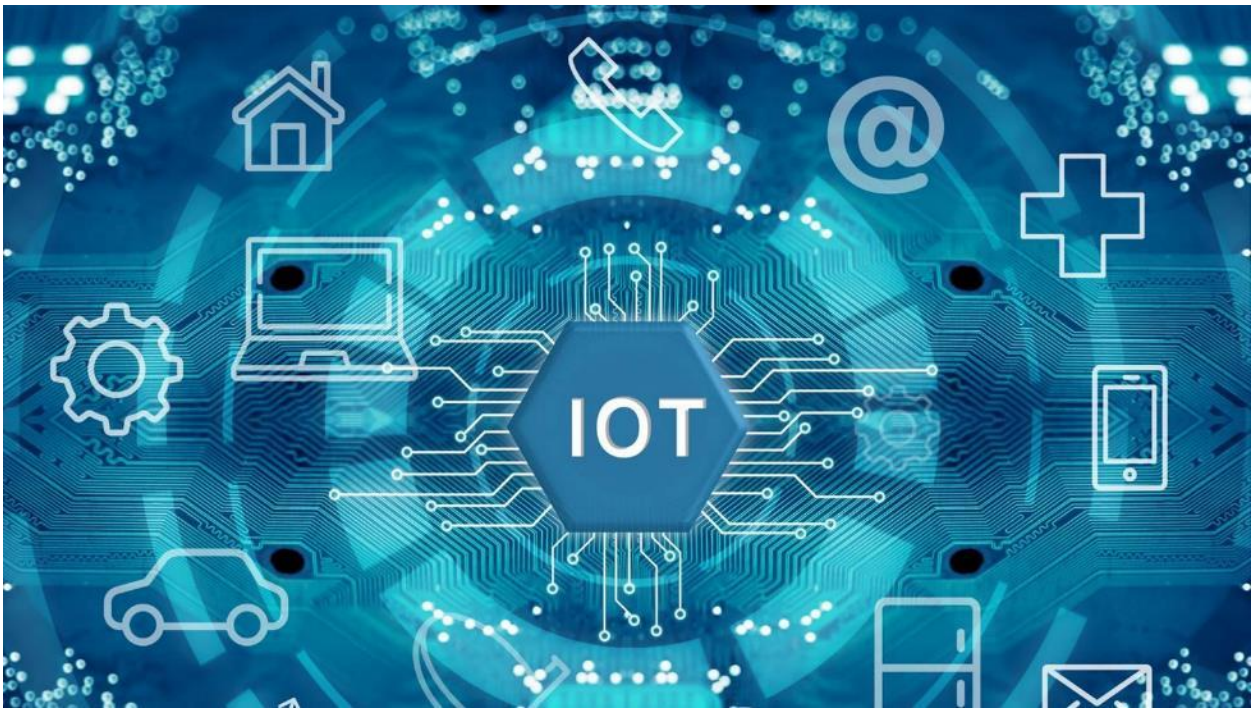
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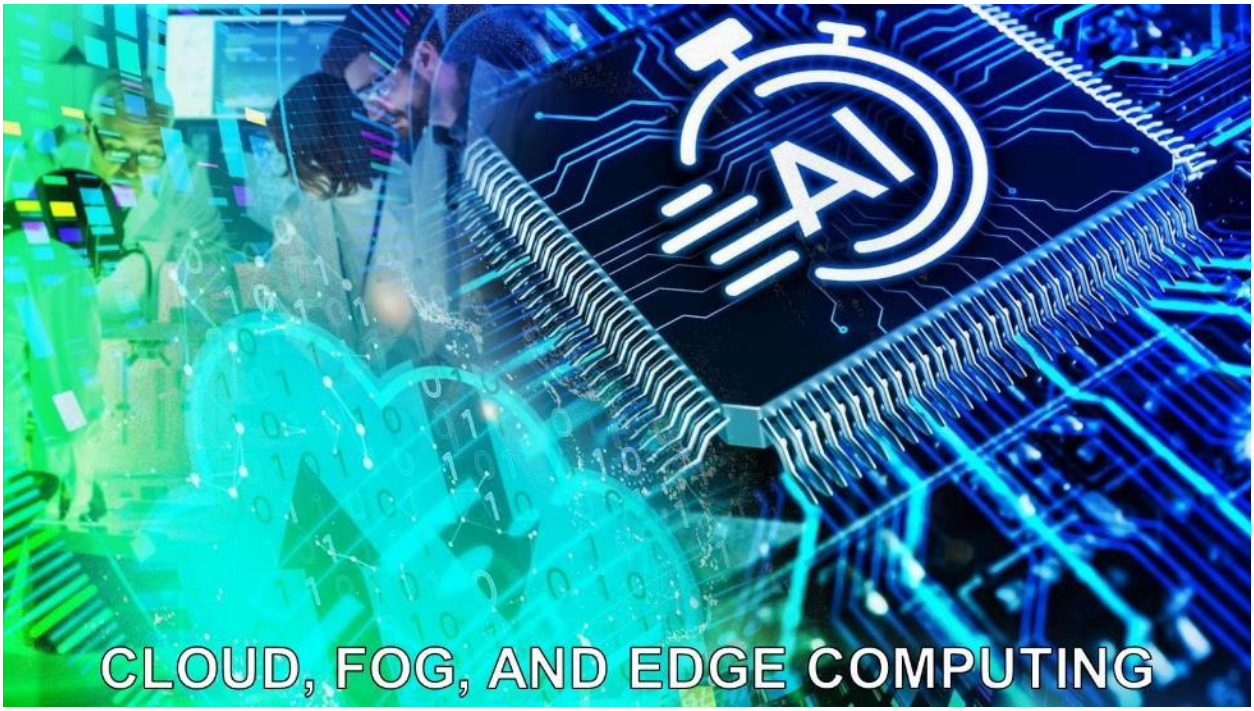
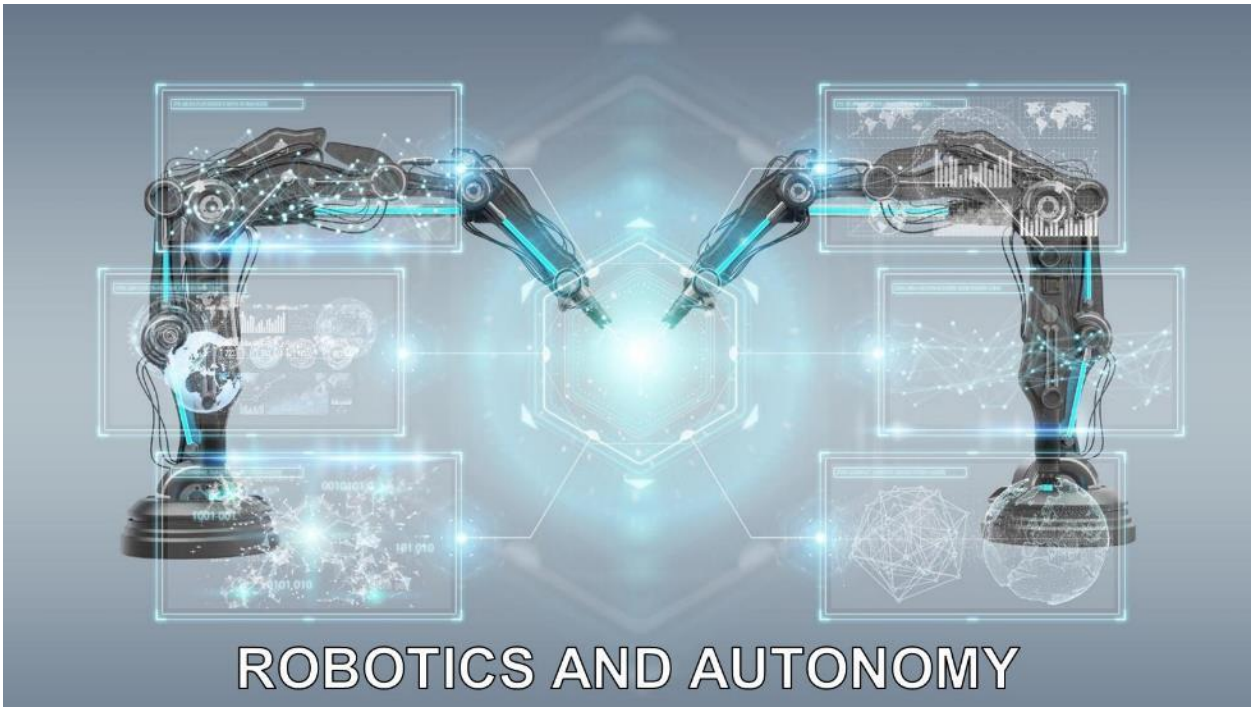
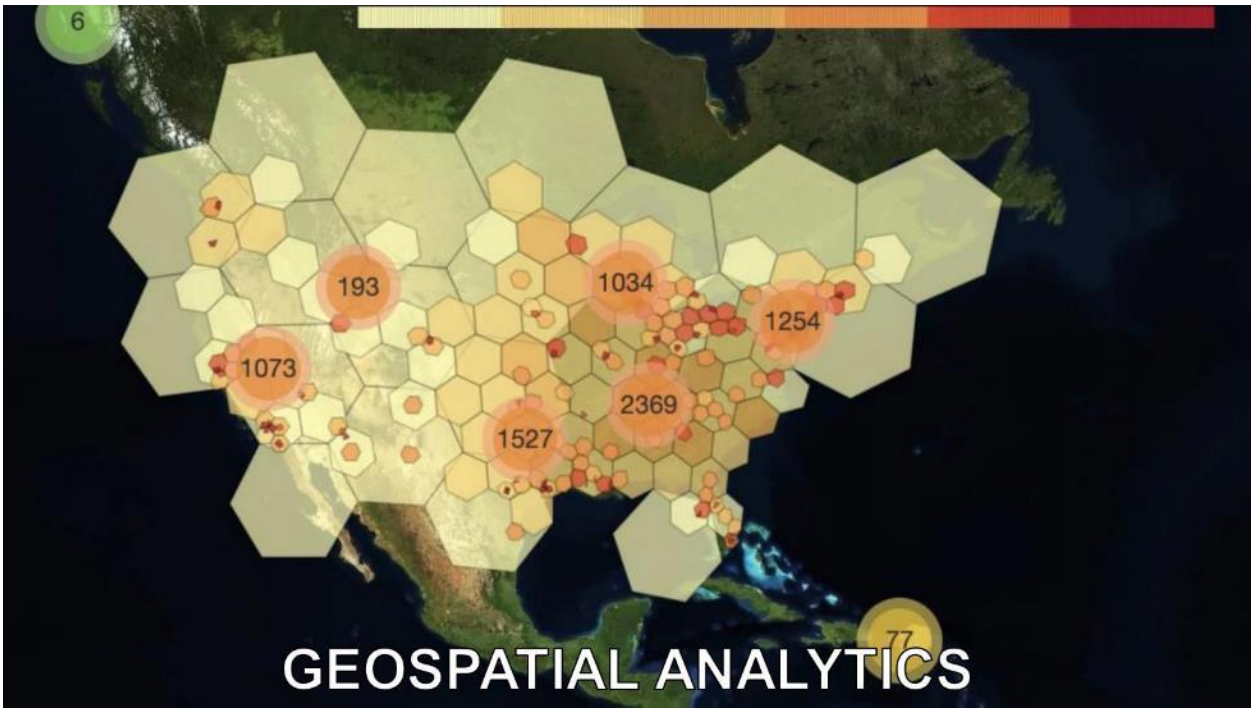

CLOUD, FOG, AND EDGE COMPUTING


DATA FABRIC AND DATA MESH


ROBOTICS AND AUTONOMY


Additional Transmission
Improving Resilience for All-Hazards
SITUATIONAL AWARENESS TOOLS


DIGITAL TWINS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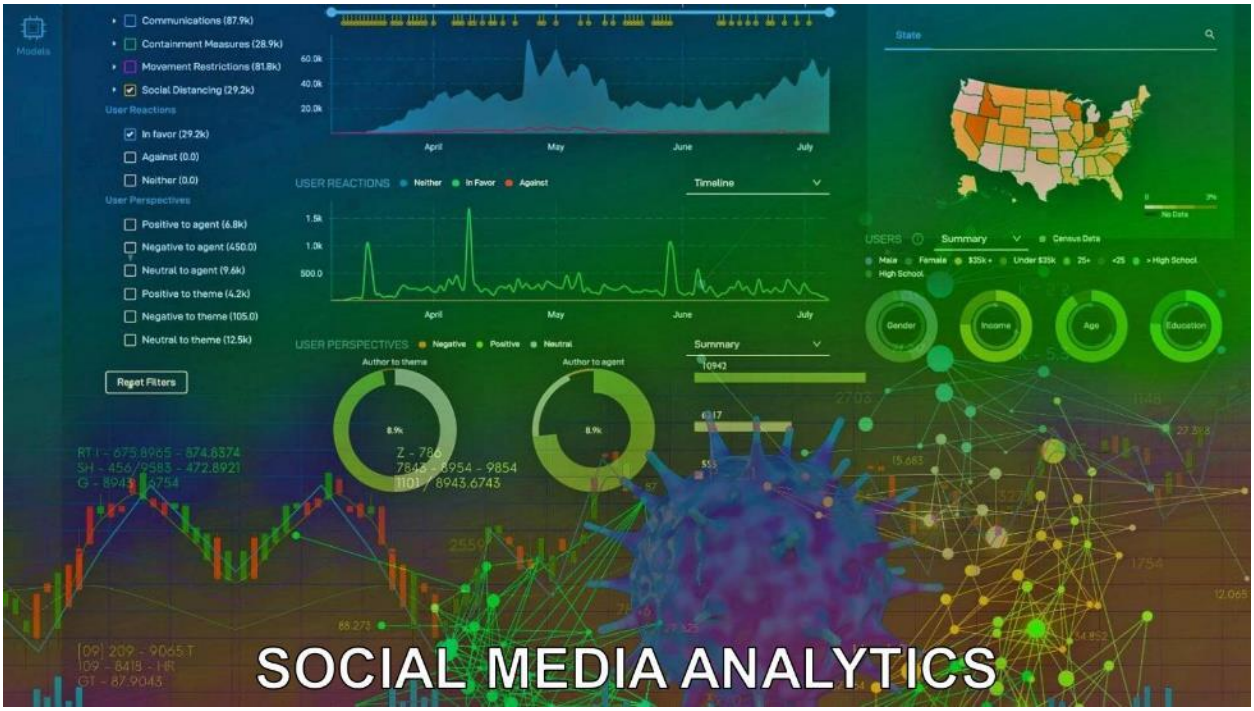
GEOSPATIAL ANALYTICS


Communications (87.9k)
Containment Measures (28.9k)
Movement Restrictions (81.8k)
Social Distancing (29.2k)
User Reactions
In favor (29.2k)
Against (0.0)
Neither (0.0)
User Perspectives
Positive to agent (6.8k)
Negative to agent (450.0)
Neutral to agent (9.6k)
Positive to theme (4.2k)
Negative to theme (105.0)
Neutral to theme (12.5k)
Reset Filters
USER REACTIONS
Timeline
USER PERSPECTIVES
Summary
State
USERS
Gender
Income
Age
Education
SOCIAL MEDIA ANALYTICS


ADVANCED WIRELESS COMMUNICATIONS

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Exercise Parameters

- Formatted to address research questions.
- Injects and questions focused on technology.
- Emphasis on creative, unconventional thinking in the present and 5-10 years in the future.
- Be concise in your comments so that as many as possible can participate.
- Expect a rapid pace and a fun exercise.

18

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Module 1 – Pandemic Response Plan

19

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Pandemic Response Plan

Conditions:

- H5N1 variant (H5N1X), highly contagious, human-to-human transmission
- 8-10% of cases are hospitalized
- 50-60% of hospitalized cases are fatal

Expected Impacts:

- Hospitals overwhelmed with H5N1X patients, exceeding regional response capabilities
- High demands for supplies, shortage of healthcare workers
- Time needed to develop a vaccine and diagnostic test(s)

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Task – Technology Crosswalk

- From this scenario, what are the tasks that must be performed, but ideally you would spend your time doing something else?
  - Time-consuming
  - Mundane
  - Repetitive
- What are the most difficult challenges to overcome?

21

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Research Questions on Technology Solutions

1. Does the proposed technology provide a solution?
2. How would the proposed technology be implemented?
3. What benefits does the proposed technology provide (faster, easier, smarter, time saver etc.)?
4. Can the solution be applied to other problems?
5. Are there any concerns about the proposed technology, such as safety, cost, or impacts to other systems?

22

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Module 2 – Hospitalization Surge and Cyber-Attack

23

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Hospitalization Surge and Cyber-Attack

Conditions:

- 14% hospitalization rate in Hillsborough County; 33.8% national hospitalization rate
- Shortages of supplies and critical equipment
- H5N1 vaccine is a poor match for this variant

Cyber-Attack Impacts:

- Manipulated patient charts, disease tracking metrics
- Sabotaged medical devices
- Billing and payroll systems compromised

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Task – Technology Crosswalk

- As the scenario has evolved, are there new tasks that come to mind which again must be performed, but ideally you would spend your time doing something else?
  - Time-consuming
  - Mundane
  - Repetitive
- Any new challenges that rise to the top of the most challenging list?

25

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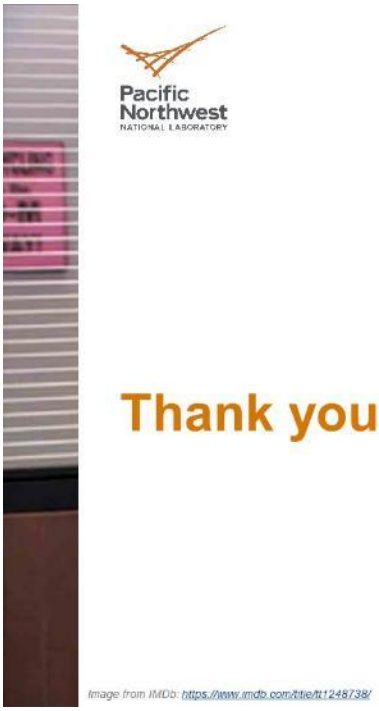
Research Questions on Technology Solutions

1. Does the proposed technology provide a solution?
2. How would the proposed technology be implemented?
3. What benefits does the proposed technology provide (faster, easier, smarter, time saver etc.)?
4. Can the solution be applied to other problems?
5. Are there any concerns about the proposed technology, such as safety, cost, or impacts to other systems?

26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Thank you
Image from IMDb: https://www.imdb.com/title/tt1248738/


Certificate of
Achievement
27

Appendix C – Participant Feedback

The following is a summary of participant feedback from the TTX. Names and identifying information have been removed.

1. Was the engagement an effective use of your time?
   - Very much so – 17 (100%)
   - Somewhat
   - Not so much
   - Not at all

2. Did the activity deliver the outcomes that you were expecting?
   - Yes – 12 (71%)
   - No
   - I had no expectations – 5 (29%)

3. Would you attend another PNNL-facilitated tabletop exercise?
   - Yes – 17 (100%)
   - No
   - Not Sure

4. How did you find the format of the exercise presentation? Was it effective?
   - Great guidelines for productive group discussion
   - Very effective, input from multiple EM/response partners fostered interesting conversations
   - Mural whiteboard was helpful
   - Appreciated review of AI at beginning
   - Easy to understand
   - Appreciated questions to guide discussion and how one question built off another
   - Very interactive, great to hear different points of view

5. What were your top key takeaways from the exercise?
   - AI has many uses, exercise was good for evaluating good/bad/ugly
   - Use AI where appropriate—sometimes human relationships are better; greater awareness of tech advantages/disadvantages
   - Gained more knowledge of what AI is capable of for EM
   - Opportunities w/ emerging tech are endless; great potential
   - Change is needed and there are hopeful options
   - Diversifying sources of information will be critical to defend against emerging AI threats
   - Importance of networking
   - Future is scary and exciting
   - Data validation
   - Big picture, collaborative thinking
   - Lack of unified command structures to combine all emergency response services

- AI situational awareness, trusted authentication (confidence)
- Importance of different perspectives

6. Please provide any other feedback you have about the exercise (e.g., what worked well, suggestions to make it better, additional information needed prior to the TTX).

- Maybe a breakout group element
- Facilitation, modules were great; follow-up opportunities for what comes next
- Strong ability of presenters to push boundaries of thinking (very knowledgeable)
- 4-5 hours was a great length
- Varied scenarios, different enough to problem solve
- Give some focus on the practical management of emergency
- Mural board was great—could give participants access
- Interaction/participation was great

7. Please provide input on any other scenarios, technologies, and other subject areas that should be topics for consideration/require deeper exploration in future tabletop exercises.

- Situational awareness: scenario/technologies, public info, sheltering/evacuation, hazard analysis
- Power grid failure
- Quantum computing threats
- Additional variety of scenarios to explore all facets of EM
- Forecasting impacts from severe weather systems
- More tech-oriented discussion
- Mix in live demo of AI tools during exercise
- Biometric validation
- Unified reporting
- Autonomous medical
- Holograms for presence coupled w/ GIS info layers
- Keep talking about cyberattacks

8. If you would like to be engaged in any additional workshops or discussions regarding EM or first responders, please provide your name and email.
[removed]

Notecards:
RBAC Dashboard for info share
Report to show health and human safety impact on revenue and rapport
Containment methods tool
Offensive defense suggestions tool
Virtual EOC (build the ultimate common operating picture)

- Wall w/ digital twin of city w/ all city services
- Flyover mapping
- CI list
- Damage assessment reporting

- Info from drone/autonomous vehicle recon
- Crowd-sourcing
- Workshop response options in real-like conditions

“Hard stuff”

- Supporting staff and making sure they can do their jobs
- Impacts to infrastructure
- Loss of public transportation
- Loss of schools/daycare
- Protocols to keep staff safe (PPE, staff plans)
- Family member health impacts
- Cross training

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