

Chemical Safety and Climate Resilience Tabletop Exercise

IMPROVING EMERGENCY RESPONSE PLANS TO MITIGATE CHEMICAL EXPOSURES AND CHEMICAL EMERGENCY IMPACTS

Massachusetts Office of Technical Assistance

Situation Manual

June 24 & 25, 2025

This Situation Manual (SitMan) provides exercise participants with all the necessary tools for their roles in the exercise. Some exercise 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. All exercise participants may view the SitMan.

EXERCISE OVERVIEW

Exercise Name	Discussion-Based Exercise
Exercise Dates	June 24 & 25, 2025
Scope	This exercise is an in-person tabletop exercise that is planned for 5 hours. The tabletop exercise will be offered in 2 separate locations for different attendees on consecutive days.
Focus Area(s)	Mitigation and Response
Capabilities	<ul style="list-style-type: none"> • Planning • Public Information & Warning • Intelligence & Information Sharing • Long-term Vulnerability Reduction
Objectives	<ol style="list-style-type: none"> 1. Increase awareness among attendees about chemical hazards, the risk of exposure and negative health impacts as a result of a disaster, and available technical assistance resources 2. Identify critical components for effective plans to mitigate the impact of a chemical emergency 3. Foster engagement between businesses, first responders, and community partners 4. Identify strengths and gaps in existing emergency plans and protocols
Threat	Chemical hazard release as a result of an extreme weather event associated with climate change
Scenario	Hurricane Margo, a Category 3 storm makes landfall and brings 12-15 inches of rain, severe flooding, and 115 mph winds.
Sponsor	MA Executive Office of Energy and Environmental Affairs (EEA), Office of Technical Assistance (OTA)
Participating Jurisdictions/ Organizations	<ul style="list-style-type: none"> • Businesses/manufacturers using or storing chemicals • Municipal department staff including first responders and public health personnel • Community-based environmental justice organizations • Regional/Local Emergency Planning Committee members (REPCs/LEPCs) • Regional Health and Medical Coordinating Coalition (HMCC)
Point of Contact	<p>Kari Sasportas Outreach & Chemical Policy Analyst, OTA kari.sasportas@mass.gov</p> <p>Alyson Cobb Exercise Coordinator, JSI alyson.cobb@jsi.org</p>

General Information

Objectives

The following exercise objectives in Table 1 describe the expected outcomes for the exercise. The objectives are linked to capabilities, which are the means to accomplish a mission, function, or objective based on the performance of related tasks, under specified conditions, to target levels of performance. The objectives and aligned capabilities were guided by senior leaders and selected by the Exercise Planning Team.

Table 1. Exercise Objectives and Associated Capabilities

Exercise Objectives	Capability
Increase awareness among attendees about chemical hazards, the risk of exposure and negative health impacts as a result of a disaster, and available technical assistance resources.	<ul style="list-style-type: none">● Planning● Long-term Vulnerability Reduction
Identify critical components for effective plans to mitigate the impact of a chemical emergency.	<ul style="list-style-type: none">● Planning● Public Information & Warning● Intelligence & Information Sharing
Foster engagement between businesses, first responders, and community partners.	<ul style="list-style-type: none">● Planning● Long-term Vulnerability Reduction
Identify strengths and gaps in existing emergency plans and protocols.	<ul style="list-style-type: none">● Planning

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, and their respective roles and responsibilities, are as follows:

- **Players:** 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.
- **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:** 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.

- **Evaluators:** Are assigned to observe and document certain objectives during the exercise. Their primary role is to document player discussions, including how and if those discussions conform to plans, policies, and procedures.

Exercise Structure

This exercise will be a multimedia, facilitated exercise. Following a background presentation, players will participate in the following three modules:

- Module 1: Preparedness
- Module 2: Response
- Module 3: Recovery

Exercise Guidelines

- This exercise will be held in an open, no-fault environment wherein capabilities, plans, systems, and processes will be evaluated. Varying viewpoints, even disagreements, are expected.
- Respond to the scenario using your knowledge of current plans and capabilities (i.e., you may use only existing assets) and insights derived from your training.
- Decisions are not precedent-setting and may not reflect your jurisdiction's/organization's final position on a given issue. This exercise is an opportunity to discuss and present multiple options and possible solutions.
- Issue identification is not as valuable as suggestions and recommended actions that could improve efforts. Problem-solving efforts should be the focus.
- The assumption is that the exercise scenario is plausible and events occur as they are presented. All players will receive information at the same time.

Exercise Evaluation

The evaluation of the exercise is based on the exercise objectives and aligned capabilities and critical tasks, which are documented in the Exercise Evaluation Guides (EEGs). Evaluators have EEGs for each of their assigned areas. Additionally, players will be asked to complete participant feedback forms. These documents, coupled with facilitator observations and notes, will be used to evaluate the exercise and compile the After-Action Report (AAR)/Improvement Plan (IP).

Background Information

Prior to the start of the exercise, a background presentation will cover Chemical Safety, Climate Preparedness, and Toxics Use Reduction

MODULE 1: PREPAREDNESS

Scenario

It's September 14, 2025. Hurricane Margo, a Category 3 storm, is expected to make landfall in 24 hours. Forecasts predict up to 12-15 inches of rainfall, coastal storm surge, and sustained winds up to 115 mph.

This is only the fourth Category 3 storm to ever hit Massachusetts; meteorologists are attributing this storm's ferocity to extreme weather patterns associated with climate change.

While emergency responders, public health, and other organizations prepare their communities for the impact, manufacturers and staff at businesses that use chemicals are also taking steps to secure their facilities.

See Module 1 Group-specific injects for further scenario information.

Discussion Questions

1. Businesses:
 - a. What steps is your facility taking to prepare the facility ahead of the storm?
2. Emergency Management:
 - a. What steps are local emergency management and first responders taking in preparation for the hurricane?
3. Public Health and Community Partners:
 - a. What steps are public health and other partners at the table taking in preparation for the hurricane?
 - b. What populations are you most concerned about in the community?
4. All:
 - a. Who is communicating with the public, including communities who may be at higher risk of negative impacts as a result of the storm?
 - b. What are the key messages that will be communicated?
 - c. Through what channels are the messages being communicated?
 - d. What strategies should plans include to communicate to people with language access needs (e.g., language interpretation/translation and accessibility)?

MODULE 2: RESPONSE

Scenario

Hurricane Margo makes landfall, bringing high winds and severe flooding throughout the region. Widespread power outages impact critical infrastructure across the state.

Emergency management agencies in your region have issued evacuation notices for low-lying areas. 450 residents have already relocated to shelters around the region, the largest of which is located at District High School.

Your facility loses power at 3 a.m.

See Module 2 Group-specific injects for further scenario information.

Discussion Questions

1. Businesses:
 - a. Please provide a situational update and assessment of your facility and situation.
 - b. Assuming the alert system had worked, who would have been alerted of the situation?
 - c. What community partners or emergency management personnel would have been contacted and how?
 - d. Who would your facility alert of the situation?
 - e. What mitigation steps can your facility take to contain the toxic or hazardous chemical and prevent its further release?
 - f. What are the barriers to doing so?
 - g. Who is communicating the status of the release to first responders and community partners?
2. What steps will emergency management, public health, and community partners take once they are made aware of the situation?
 - a. Public Health and Partners:
 - i. Which local residents are likely to face barriers to evacuation?
 - ii. How will you address access and functional needs?
 - b. Emergency Management:
 - i. What steps will you take to ensure local residents are aware of evacuation notices?
 - ii. How will you accommodate people with disabilities, medical needs, language access needs, and transportation given the closed roads from the hurricane?
3. All:
 - a. What steps will be taken to prevent respiratory exposure at District High School?
 - b. Who is communicating with the public?
 - c. What are the key messages that will be communicated?
 - d. Through what channels are the messages being communicated?

MODULE 3: RECOVERY

Scenario

Over time, the chemical has dissipated and no risk remains.

Following the release, 35 individuals had minor injuries and 5 were hospitalized including first responders, people sheltering at District High School, and residents from the community who were unable to evacuate.

Fortunately, there are no fatalities due to steps taken by the facility and local first responders.

Discussion Questions

1. What can Baystate Refrigerated Services, Sticky, Inc., and other similar facilities do to be more prepared for future storms?
2. What information would be helpful for local first responders to have about these facilities, or other similar facilities, in advance of a disaster to be able to better prepare? How is this information best shared with responders?
3. What steps can you take to reduce toxic chemical use at your facility and prevent this scenario?

APPENDIX A: EXERCISE SCHEDULE

9:00 - 9:30	Registration & Networking
9:30 - 9:40	Welcome & Introductions
9:40 - 10:20	Background Information
10:20 - 10:30	Break
10:30 - 10:40	Introduce to Today's Exercise
10:40 - 11:50	Module 1: Preparedness
11:50 - 12:20	Lunch
12:20 - 1:20	Module 2: Response
1:20 - 1:30	Break
1:30 - 2:05	Module 3: Recovery
2:05 - 2:30	Debrief & Next Steps

APPENDIX B: EXERCISE PARTICIPANTS

Registered Organizations	
Lawrence - June 24, 2025	Holyoke - June 25, 2025
<ul style="list-style-type: none"> • BME Strategies • C.I.L. Electroplating • City of Attleboro • City of Lawrence • City of Somerville • Emerson • Eversource • Kettle Cuisine • Lawrence Fire Department • Lush Nails • Massachusetts Coalition for Occupational Safety & Health (MassCOSH) • Massachusetts Office of Technical Assistance (OTA) • Mercy Beauty Center • Metalor Technologies • Methuen Fire Department • Metropolitan Area Planning Council (MAPC) • Microchip Technology • Naisha Beauty Supply & Salon • Pace Industries • Sanborn, Head & Associates • Tamraparni • Tecomet • The Toxics Use Reduction Institute (TURI) • Town of Andover • Town of Barnstable • Town of Bedford • Unistress Corporation • Various Community Members 	<ul style="list-style-type: none"> • Central Massachusetts Regional Planning Commission (CMRPC) • Chicopee Local Emergency Planning Committee (LEPC) • City of Somerville • Franklin Regional Council of Governments (FRCOG) - Health and Medical Coordinating Coalition (HMCC) • Holyoke Health Center • Interprint Inc. • Massachusetts Office of Technical Assistance (OTA) • Mayhew Steel Products • Middleborough Fire Department • Nuestras Raíces • The Public Health Institute Of Western Massachusetts • The Red Cross • The Toxics Use Reduction Institute (TURI) • Town of South Hadley • Ultra Maritime • Unistress Corporation • Various Community Members • Vicinity Energy Boston

APPENDIX C: ACRONYMS

Acronym	Term
AAR/IP	After Action Report/Improvement Plan
CAA	Clean Air Act
CFATS	Chemical Facility Anti-Terrorism Standard
CWA	Clean Water Act
EEA	Energy and Environmental Affairs
EEG	Exercise Evaluation Guide
EJ	Environmental Justice
EMI	Emergency Management Institute
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
FEMA	Federal Emergency Management Agency
FRP	Facility Response Plan
GAO	Government Accountability Office
GHG	Greenhouse Gas
HMCC	Health and Medical Coordinating Coalition
HSEEP	Homeland Security Exercise and Evaluation Program
HVAC	Heating, Ventilation, and Air-Conditioning
MassDEP	Massachusetts Department of Environmental Protection
OSHA	Occupational Safety and Health Administration
OTA	Office of Technical Assistance
PHEP	Public Health Emergency Preparedness
RCRA	Resource Conservation and Recovery Act
REPC/LEPC	Regional/Local Emergency Planning Committee
RMP	Risk Management Plan
SHMCAP	State Hazard Mitigation and Climate Adaptation Plan
SIC	Standard Industrial Classification
SitMan	Situation Manual
SME	Subject Matter Expert
SPCC	Spill Prevention Control and Countermeasure Rule
StartEx	Start of Exercise

Acronym	Term
TRI	Toxics Release Inventory
TTX	Tabletop Exercise
TURA	Toxics Use Reduction Act
TURI	Toxics Use Reduction Institute
WPI	Worcester Polytechnic Institute

APPENDIX D: CHEMICAL-SPECIFIC SCENARIO INJECTS

Module 1, Baystate Refrigerated Services

While emergency responders, public health, and other organizations prepare their communities for the impact, Baystate Refrigerated Services is also taking steps to prepare for the storm. Baystate uses a 120,000 pound capacity ammonia refrigeration system to cool its 26,000 square foot facility. Cleaning and sanitizing chemicals are also stored at the warehouse.

The anhydrous ammonia is stored in a liquid state under pressure in an outdoor steel storage tank on the roof of the building at a controlled temperature. The refrigeration system has piping from the outdoor tank around the outside of the building into the building with several safety relief valves and a leak detection system with sensors and an alarm that requires a power source to operate. There are no remote operated shut-off valves.

While the coming hurricane is larger than any experienced in the area since they've been in business, Baystate has never flooded before and rarely loses power, so leadership decides that the risks to the facility are low.

Handouts:

- Baystate Refrigerated Systems Emergency Plan Summary
- <https://cameochemicals.noaa.gov/report?key=CH4860>
- <https://nj.gov/health/eoh/rtkweb/documents/fs/0084.pdf>
- <https://www.nj.gov/health/eoh/rtkweb/documents/fs/0084sp.pdf>

Module 1, Sticky Inc.

While emergency responders, public health, and other organizations prepare their communities for the impact, Sticky Inc., an adhesive manufacturing facility, takes steps to prepare for the storm. One concern is that Sticky Inc. stores 30,000 pounds of toluene per storage tank at a given time, with multiple outdoor tanks on-site that are double-walled and tightly sealed to prevent vapor release under normal operating conditions. There is a tank alert system for detecting toluene gas, but it hasn't been tested recently. Other chemicals stored on-site include additional solvents as well as resins, fillers, and other additives.

Handouts:

- Sticky Inc. Emergency Plan Summary
- <https://cameochemicals.noaa.gov/report?key=CH4654>
- <https://nj.gov/health/eoh/rtkweb/documents/fs/1866.pdf>
- <https://www.nj.gov/health/eoh/rtkweb/documents/fs/1866sp.pdf>

Module 2, Baystate Refrigerated Services

At 4:00 a.m., debris blown by heavy winds collides with rooftop refrigeration system piping and damages an outdoor valve, depressurizing the liquid anhydrous ammonia and causing a slow leak of ammonia gas into the surroundings.

Due to the power outage and a fault in the battery back-ups, the sensors that would normally alert facility supervisors of system pressure loss fail. However, within five minutes, multiple residents living near the facility call 911 complaining of burning eyes and difficulty breathing. Several report seeing a white cloud or smoke on the roof of the Baystate building.

Wind patterns push the chemical plume southwest towards District High School, where the evacuees are sheltering. In addition, officials are aware that many residents from a nearby neighborhood were unable to evacuate due to lack of access to transportation and other barriers. 911 continues to receive calls from residents reporting strong chemical odors and respiratory issues. After being delayed by washed out roads, the fire department has arrived with PPE to assess the situation.



Module 2, Sticky Inc.

At 4:00 a.m., Hurricane Margo uproots a large sycamore tree, which hits a transformer and power line adjacent to Sticky Inc. The transformer and power line land on and cracks an outdoor storage tank holding 30,000 pounds of toluene, releasing vaporized toluene. In the collision, the transformer catches fire and ignites the vapor in an explosion of fire and billowy black smoke. The toluene continues to slowly leak, fueling the fire, but the leak alert system, meant to notify facility management and the fire department remotely, is not working as intended due to poor maintenance over time.

Local residents call 911 after experiencing respiratory irritation and dizziness, and noticing a sweet and pungent odor in the air. Other neighbors call to report observing a black plume of smoke drifting above the facility.

Wind patterns push the chemical plume southwest towards District High School, where the evacuees are sheltering. In addition, officials are aware that many residents from a nearby neighborhood were unable to evacuate due to lack of access to transportation and other barriers. 911 continues to receive calls from residents reporting strong chemical odors and respiratory issues. After being delayed by washed out roads, the fire department has arrived with PPE to assess the situation.

