



Lessons Learned Information Sharing

www.LLIS.gov



TOPOFF 3 EXERCISE LESSON LEARNED

Agent Confirmation and Hazard Area Identification: The Interagency Modeling and Atmospheric Assessment Center's Common Plume Picture

LESSON LEARNED

The Interagency Modeling and Atmospheric Assessment Center (IMAAC) successfully provided a common plume picture for use by federal, state, and local officials.

BACKGROUND

In a chemical, biological, or radiological attack, early identification of the lethal agent, combined with a clear definition of the hazard area and the potentially exposed population, can save lives, speed effective treatment of symptoms, and prevent injury to medical responders. These essential elements of information drive decisions made by top officials at federal, state, and local levels. Information that is critical to rapid and effective response activities includes understanding what lethal agents were released, where they were released, and where the contamination is likely to spread. The TOPOFF 3 (T3) full-scale exercise (FSE) provided the opportunity to observe the progress that has been made in creating a single authoritative source for plume modeling. The FSE also highlighted issues in coordinating data and information to confirm the agent and to define the hazard area.

About this Lesson Learned

The Department of Homeland Security (DHS) has not cleared the TOPOFF 3 After-Action Report (AAR) for release. DHS has allowed *LLIS.gov* to extract this and other Lessons Learned from the AAR. *LLIS.gov* has retained as much of the original text as possible and made only minor changes. For more information about the exercise scenario and to view all the *LLIS.gov* TOPOFF 3 Lessons Learned, please see the [TOPOFF 3 Full-Scale Exercise Lessons Learned Report](#).

Various federal, state, and local agencies have the capacity and responsibility to test for the presence and identity of weapons of mass destruction (WMD) agents. Fire department personnel, specialized hazardous material units, environmental agencies, and law enforcement personnel perform environmental sampling. Medical personnel collect samples from individuals to provide additional data about the agent. The overarching goal of all agencies is to identify the agent used in the attack and the extent of its spread. However, these agencies represent three different areas of interest: (1) first response, (2) law enforcement, and (3) environmental remediation. Each uses the results from the sampling differently and usually operates during different response phases: initial response to the emergency, criminal investigation, and clean up, respectively. "Response phase" indicates a change in focus as a response progresses, although there really are no clear lines of demarcation between the response and recovery phases. Rather, overlapping and integrated operations occur across phases, with the understanding that priorities change over time. To support their missions, all groups have developed and fielded the ability to collect samples and to identify unknown agents.

When the presence of a chemical, biological, or radiological agent is suspected, response personnel and decision makers may use plume modeling and case definitions to determine the likely hazard areas and to identify at-risk populations. With this information, responders can tailor their responses to the scenario, and decision makers can begin to craft policies that best address the circumstances of the release.

The T3 FSE provided an opportunity to learn about the response mechanisms that officials use to identify and confirm unknown WMD agents and to define hazard areas during an incident response. In Connecticut, officials were responding to the release of a fast-acting sulfur mustard agent from which victims exhibited symptoms within hours of exposure. The terrorists used two methods to disseminate the mustard agent in Connecticut. First, the terrorists used a small aircraft to release sulfur mustard in a gaseous form over the New London City Pier on the Thames River. Second, the terrorists detonated an explosive device at the head of the pier, which also disseminated sulfur mustard.

Exercise play in Connecticut presented response organizations with an opportunity to exercise the coordination processes required for identification of the chemical agent and definition of the hazard area. Overall, these activities appeared more coordinated, efficient, and successful than in the TOPOFF 2 (T2) FSE. The T3 FSE also showed how much improvement has been made since T2 in coordinating and developing analysis products to support top officials' decision making about the hazard area and the effects of contamination on the population. Despite these success stories, T3 showed that room for improvement still exists.

ANALYSIS

The IMAAC played a critical role in the Connecticut response by producing, coordinating, and disseminating consequence predictions for an airborne hazardous materials release. The IMAAC was identified as the single authoritative source for federal plume models of the effects early in the T3 FSE. This resulted in dramatically less confusion regarding such products than in previous exercises. Over the next four days, the IMAAC released seven additional sets of plume products as well as some revisions to specific model runs within the sets.

The use of the IMAAC as the single source for plume models successfully reduced the number of conflicting products provided to decision makers and contributed to a common picture across the various response organizations and command centers. The T3 FSE demonstrated significant improvement over the T2 FSE in this respect. However, there remain several opportunities for improvement, including:

- Continued availability of additional plume products and analysis;
- Management of contradictory requests for the IMAAC products; and
- Coordination of emergency responders, law enforcement officials, and environmental responders on scene.

During the T3 FSE, decision makers faced some challenges concerning the number of IMAAC model runs completed and products distributed during the exercise—essentially, a problem of version control. These products had differences ranging from slight revisions to different driving assumptions. Early model runs were not effectively taken out of play or retired; it was often unclear which model run was the most current. As a result, there were instances in which command centers or participants not collocated referred to different products.

Problems with version control are a common result of distribution processes and the time lag between receipt and further distribution of updates.

Processes associated with providing data and requesting products may need to be reexamined. The IMAAC is not equipped to consolidate the inputs it receives or to resolve discrepancies among them. Serious consideration should be given to the decision to allow multiple agencies at federal, state, and local levels to have direct access to the IMAAC operations cell. The response flexibility granted by such access should be weighed against the potential for conflicting inputs or requests. Procedures need to be developed on how the IMAAC should handle discrepancies in data inputs and requests that do not align with previously provided inputs or scientific evidence.

RECOMMENDED COURSES OF ACTION

- Clarify the IMAAC processes for receipt and review of other modeling products, and establish a protocol for other modeling agencies to distribute to their consumers on the purpose of their products and the guidelines for redistribution.
- Develop procedures on how the IMAAC should handle discrepancies in data inputs or product requests, and identify a process to aid the IMAAC in deconflicting inputs.
- Clarify the responsibilities, authorities, and mechanisms for the IMAAC to formally disseminate critical information learned through its scientific analysis of the incident.

SOURCE

US Department of Homeland Security, Federal Emergency Management Agency, National Exercise Division. *Top Officials 3 After-Action Report*. Oct 2005.

DISCLAIMER

This document is distributed through *LLIS.gov* with the explicit permission of the DHS FEMA National Exercise Division.