NUSTL
NATIONAL URBAN SECURITY TECHNOLOGY LABORATORY

SAVER TechNote

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INCIDENT MANAGEMENT SOFTWARE FOR EMERGENCY RESPONSE

Incident management software (IMS) consists of a suite of tools that collect and manage critical incident data in a collaborative environment to aid decision-making. IMS captures diverse, multilayered information to provide first responders and emergency managers with knowledge critical to managing no-notice incidents and planned events at any scale. Emergency management, fire service, law enforcement, emergency medical services, and other first response agencies use IMS for incident planning, multiagency coordination, resource allocation, and asset tracking. IMS also has useful tools for after-action reporting and auditing. Incident Management Software falls under the AEL numbers 04AP-03-GISS, titled "System, Geospatial Info;" 04AP-05-CDSS, titled "Systems and Tools, ICS;" and 04AP-05-SVIS, titled "Software, Operational Space Visualization."

Overview

Every emergency response, whether confined to a street corner or spanning an entire metropolitan area, involves the synthesis of many types of information. Incident management software gathers data from multiple sources, including responder inputs, video cameras, hazard sensors, maps and modeling tools, external databases (for example, building information) and external software (e.g., resource management, computer aided dispatch). Information is integrated in a map-based platform to help individual responders and high-level decision makers visualize the overall picture of an incident and response. Information can be shared with a network of approved personnel with access to the system. IMS may also incorporate tools for event planning and response such as incident action plans (IAPs), tasking and scheduling forms, resource tracking, data logs, and documentation required for audits and after-action reporting.

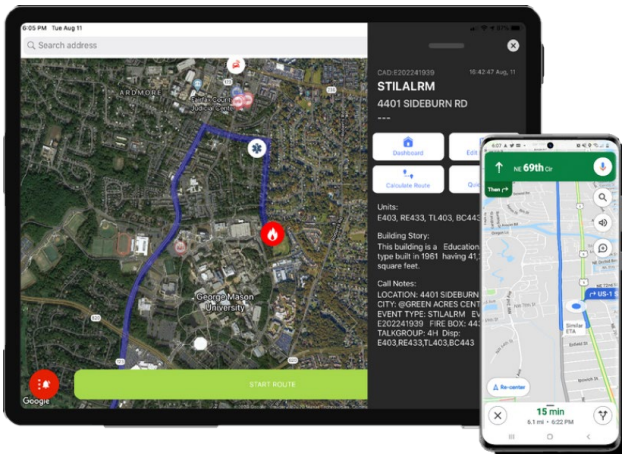

Figure 1 An IMS Interface with incident information and vehicle tracking and routing
Image credit: First Due

IMS Features

IMS gathers, tracks, shares, and displays information to form a common operating picture (COP) that allows all levels of a response – regardless of role or jurisdiction – to more effectively manage their domain during the incident.

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) program to help emergency responders improve their procurement decisions.

Located within the Science and Technology Directorate, the National Urban Security Technology Laboratory (NUSTL) manages the SAVER program and conducts objective operational assessments of commercial equipment and systems relevant to the emergency responder community.

The SAVER program gathers and reports information about equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

SAVER publications focus on answering two main questions: "What equipment is available?" and "How does it perform?"

SAVER knowledge products are created for the nation's first responders and made available to help them make operational and procurement decisions.

To explore the full reports library and to learn more, visit SAVER online at www.dhs.gov/science-and-technology/SAVER.

For additional information on the SAVER program, email NUSTL at NUSTL@hq.dhs.gov.

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Communication and collaboration tools such as instant messaging, photo sharing, or map annotations allow all levels of responders to update key information to improve the COP. Incident action planning and event logging tools ensure that actions are documented and available for after action reporting or analysis.

While critical information can be manually entered by responders at the scene, it can also be pulled from databases or received from deployed devices such as sensors that detect dangerous chemical, biological, and radiological materials.

IMS can be integrated with other software that provide weather models, social media feeds, computer aided dispatch (CAD) notifications, or resource tracking information through automatic vehicle location (AVL) systems. Information entered into IMS is often integrated with geospatial data that provides details on the location of an incident, associated hazards and on-scene emergency response resources. When combined with maps or building information, this data enables in-depth visualization of an incident response, including an asset's type, location, deployment duration, responsible owner, and immediate condition.

Connectivity Considerations

Incident management software products typically include a mobile component that communicates with a backend system responsible for routing and synchronizing data updates between field devices and a command center. As such, connectivity is central to IMS function.

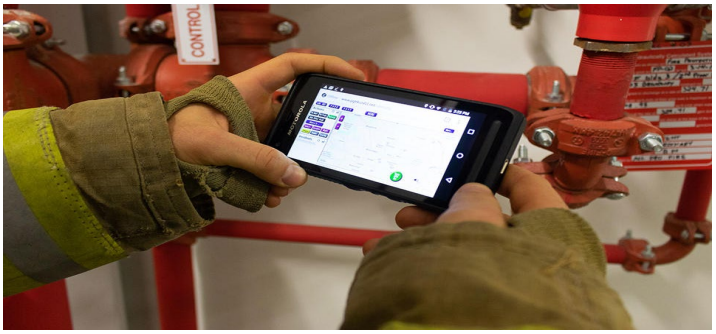

Figure 2 Responder using a Mobile Application
Image credit: National Institute of Standards and Technology

IMS installed on a mobile device or laptop may connect to one or more backend servers, a cloud platform or peer-to-peer network. Some IMS products are available as software as a service (SaaS): a web browser is all that is needed to access the data, which is stored on a remote server or cloud hosted. Data ownership policies vary by provider. For agencies that elect to manage their own peer-to-peer networks or backend servers, the need for knowledgeable IT staff to configure and deploy the system should also be part of IMS considerations.

Resilience in the absence of network and data connections is another important factor when utilizing IMS. Many IMS packages implement local device caching to ensure continued function should network data access become unavailable. When that access is restored, the system's device and servers (or cloud-based storage) synchronize the data.

IMS and FEMA Resources

Many IMS products incorporate terminology and tools consistent with the National Incident Management System (NIMS) and its Incident Command System (ICS). Managed by the Federal Emergency Management Agency (FEMA), NIMS provides a framework to prevent, mitigate, respond to and recover from all levels of incidents. NIMS includes the ICS – a standardized approach to the command, control, and coordination of on-scene incident management. Some IMS include standard ICS forms or allow for agency-customized forms and processes to be added.

In order to help NIMS/ICS implementation, FEMA provides the ICS Forms Booklet (FEMA 502-2) as a set of ICS-specific tools to support documentation activities and the creation of an Incident Action Plan (IAP) (see the FEMA Incident Action Planning (IAP) Guide). The IAP is composed of standard forms and supporting documents and communicates the objectives, tactics and resources to be used to manage the incident during each operational period. A clear IAP template, such as those that may be part of IMS, is key to guide the initial and continuing incident planning and decision activities.