Guide to Implementing the Integrated Public Alert and Warning System (IPAWS)

Version 2 | February 2019

CHEMICAL STOCKPILE EMERGENCY PREPAREDNESS PROGRAM
LOCAL STATE FEDERAL

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Introduction

The Integrated Public Alert and Warning System (IPAWS) is "the nation's alert and warning infrastructure."

> *During an emergency, alert and warning officials need to provide the public with life-saving information quickly. IPAWS is a modernization and integration of the nation's alert and warning infrastructure, and will save time when time matters most, protecting life and property. …*
>
> *Federal, state, local, tribal, and territorial alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure. IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface.*[1]

This *Guide to Implementing the Integrated Public Alert and Warning System (IPAWS)* was first published in 2014 for pilot testing. Several agencies have used this document to implement IPAWS and improve public alert and notifications for their respective communities. Since the first version of this guide, the Chemical Stockpile Emergency Preparedness Program (CSEPP) community has conducted several testing sessions, sending test, live-emergency, and live-exercise messages. The CSEPP community has also improved its use of IPAWS, the systems have evolved, and the Federal Communications Commission (FCC) and the Federal Emergency Management Agency (FEMA) have worked with the industry to improve processes and technology.

Unfortunately, several high-profile incidents have occurred where things went wrong, such as the false missile warning in Hawaii in 2018 and lack of confidence in the system and alerts not being received during major wildfires in California. Consequently, the need exists for better planning, training, and exercising of these systems.

IPAWS in itself is not an alert and notification system; IPAWS is an input service to multiple alert and notification systems. "Alerting" means giving notice to the public that an event has occurred, often through a short sound, action, or message. "Notification" incorporates more information and usually includes instructions for the public to try to protect them from the event. IPAWS uses open-source protocols to receive alerts and/or notification messages from alerting authorities and distributes messages to multiple dissemination systems.

[1] Federal Emergency Management Agency. 2015. "Integrated Public Alert & Warning System." Accessed online January 18, 2019. http://www.fema.gov/integrated-public-alert-warning-system

To provide for the effective use of IPAWS, each entity should develop a plan for how it will use this tool to benefit the public that incorporates existing and emerging alert and notification systems. To prepare an effective alert and notification plan, an agency (or authority) must have a full understanding of the environment in which the agency operates. Every community is different in terms of needs and threats, and every community's current situation—including anticipated threats, populations, capabilities, and authority—will need to be explored. Goals and objectives will need to be defined and an official document prepared that includes details and roles and responsibilities. Memorandums of understanding (MOUs) with neighboring agencies may be necessary.

The selection of alert and notification systems should be based on information gathered during the planning process. Risks and community information will drive the alert and notification systems that are needed. In most cases, this will be a group of tools and systems that are used to notify various audiences and may be a physical system or a hosted solution. Functional requirements (i.e., statements of specific functions that a system or device must or should do) are then developed based on intended or expected functions needed by the authority. Requirements should be clear, verifiable, feasible, and necessary.

Once specifications of needed functions are determined, one or multiple systems may need to be procured. These systems can be capital expenditures for fixed equipment or operational expenditures for maintenance or a service.

An alerting authority will also need authorization to access IPAWS, which is gained by following these steps:

- Select IPAWS–compatible software.
- Apply for a MOA with FEMA.
- Apply for public alerting permissions.
- Complete IPAWS web-based training.

Once all forms have been completed, signed, and approved by the State, IPAWS will issue a Collaborative Operating Group (COG) identification and digital certificate.

To use IPAWS and other alert and notification systems effectively, written documentation should be prepared that contains the information and actions needed to successfully alert and notify the public of emergencies and dangers.

All users must understand the systems and procedures, which is accomplished through initial and recurring training and exercises. IPAWS provides alerting authorities with access to a test COG for the use of training and exercises. This test COG can be programmed into many IPAWS authoring tools as a separate distribution environment.

Integrating alert and notification systems into regular operations also has benefits; it builds familiarity with systems, enables better thinking skills, and provides better

response to emergencies. Use should include operation of the technology as well as forming messages and determining distribution channels, all of which build skills.

While users require actual training on alert and notification systems, the public should also be "trained." Educating the public will increase the likelihood that the public will take actions to protect themselves when an actual event occurs.

IPAWS is a powerful tool for notifying the public with important lifesaving information. Creating an environment that supports alerting and notification communications is important. This document and associated templates can be used to develop an alert and notification plan and implement IPAWS into those plans. Templates can be modified in any way to address local situations to provide the best service to the public and responders.

The appendices of this document are attached in editable formats, when available, for agencies to use in their planning and operation.

Background

"There is no substitute for accurate knowledge. Know yourself, know your business, know your men." — Lee Iacocca

References

- Common Alerting Protocol. v. 1.2, OASIS Standard CAP-V1. 2. (2010)
- Common Alerting Protocol, v. 1.2 USA Integrated Public Alert and Warning System Profile Version 1.0. (2009)
- National Weather Service, Operations and Services; Public Weather Services, NWSPD 10-5, Non-Weather Emergency Products Specification (Instruction 10-518, July 28, 2010)
- J-STD-101 – Joint ATIS/TIA CMAS Federal Alert Gateway to CMSP Gateway Interface Specifications
- FEMA, "Integrated Public Alert & Warning System" http://www.fema.gov/integrated-public-alert-warning-system

The ability for local public safety professionals to be able to communicate with the public during emergencies is a critical function. The public looks to public safety officials to warn them of danger and inform them of actions to keep them safe.

IPAWS is a powerful tool for notifying the public with important lifesaving information. IPAWS was developed to primarily provide a national system for presidential messages, but the system is available for use by State, Territorial, Tribal, and local entities.

To provide for the effective use of this tool, each entity should develop a plan on how it will use IPAWS that incorporates existing and emerging alert and notification systems to benefit the public.

This document can be used to develop an alerting and notification plan and to implement IPAWS into those plans. This plan is used to document the current situation, goals, and procedures to implement and manage alerting and notification systems. This template can be modified in any way to address local situations to provide the best service to the public and responders.

FEMA manages and funds the core IPAWS infrastructure but not the alert origination tools or distribution channels. IPAWS is designed to provide a single authenticated entry point to the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio All Hazards system,[2] and other alerting systems. Some communities use older emergency notification systems, which may require an interface to IPAWS for interoperability.

[2] As of September 2018, the link to NOAA's National Radio All Hazards service from IPAWS was not available to local authorities, but work continues. It is in the best interest of the local authorities to monitor this process to gain this capability when it becomes available in the future.

Creating an environment that supports alerting and notification communications is important. Some of the things that can provide this environment are as follows:

- **Plans**: Pre-established plans outline what systems will be used by whom. These should include primary and alternate systems as well as systems used by other agencies.
- **Policies and Procedures**: Clear policy and procedure delineate who, when, how, and why various communications will take place.
- **Pre-defined and Pre-approved Messaging Templates**: Pre-defined messages should be developed in conjunction with a public information professional.
- **Training**: Recurring training on the use of the systems will improve users' skills. It is important to have multiple people trained on all systems.
- **Exercise**: Use of these systems on a regular basis will increase effectiveness.

This is a constant process with plans trained, exercised, and refined regularly (see Figure 4). This process also helps to keep information fresh in the minds of the users.

Figure 1: Alert and Notification Planning Process

Planning Process

The planning process is used on a regular basis by emergency management. The same process used to develop the Emergency Operations Plan (EOP) can be used. A good guide to the development of plans is FEMA's *Developing and Maintaining Emergency Operations Plans, Comprehensive Preparedness Guide (CPG) 101*, Version 2.0, November 2010. The following graphic (Figure 2) from that guide outlines this process.

Figure 2: Emergency Management Planning Process

Communications Cycle

Communications is more than a piece of equipment or technology. Understanding the communications cycle is the first step in reliable and effective communication. As the sender of information to various groups, you need to understand how the audience and the medium you use to send messages have an impact on the effectiveness of any communication. Figure 3 illustrates the communications cycle.

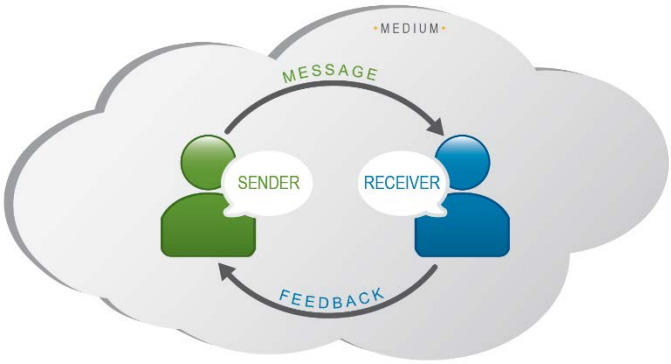

Figure 3: Communications Cycle

The message is only part of the communication. Many people place additional meaning on the medium used to transmit the message. An extreme example is the message "The Martians are coming" on a sign held by a person on the street in a major city. The street audience will place a certain meaning on that message, but if it is stated in a press conference on television from a government office, the same message is given very different meaning.

To help communications be effective and reliable, users must be familiar with the various systems available and the impact of each system and audience. If a message is not understood by the audience or the audience attaches meanings that are not intended, effective communication has not occurred. The communications needed during an emergency require the audience to receive, understand, and take any necessary protective action in response to the message.

Understanding Alert, Warning, and Notification

Alert, warning, and notification are different actions, but all are important to protect the public (see Figure 4). An **alert** means giving notice to the public that an event has occurred; this is often a short sound, action, or message. For a radio listener, the alert would be the EAS tones and headline that precedes an EAS message.

A **warning** is used to prepare the public for a potential risk. Warnings often include actions the public can take to mitigate the impact of the risk.

A **notification** has more information and usually has instructions for the public to try to protect them from the event. For a radio listener, this would be the description and instructions in the EAS message.

Figure 4: Alert, Warning, and Notification

Understanding the difference between alert, warning, and notification as well as the capabilities of the associated systems is needed to provide an effective, reliable, and rapid means of communications to the public in the event of natural or human-caused disasters. Alerting authorities must understand alerting the public of a danger and notification of what actions to take.

Understanding How IPAWS Works

The alert and notification systems in the United States have been developed over time (see Figure 5). In the early days of the Cold War, it was realized that there needed to be a rapid way to alert the public of impending attack. This need was addressed in a basic way with the CONtrol of ELectromagnetic RADiation (CONELRAD) system. CONELRAD

was a basic system where participating stations would receive a nationwide notice and then locally initiate a sequence of pre-defined actions to warn the public.

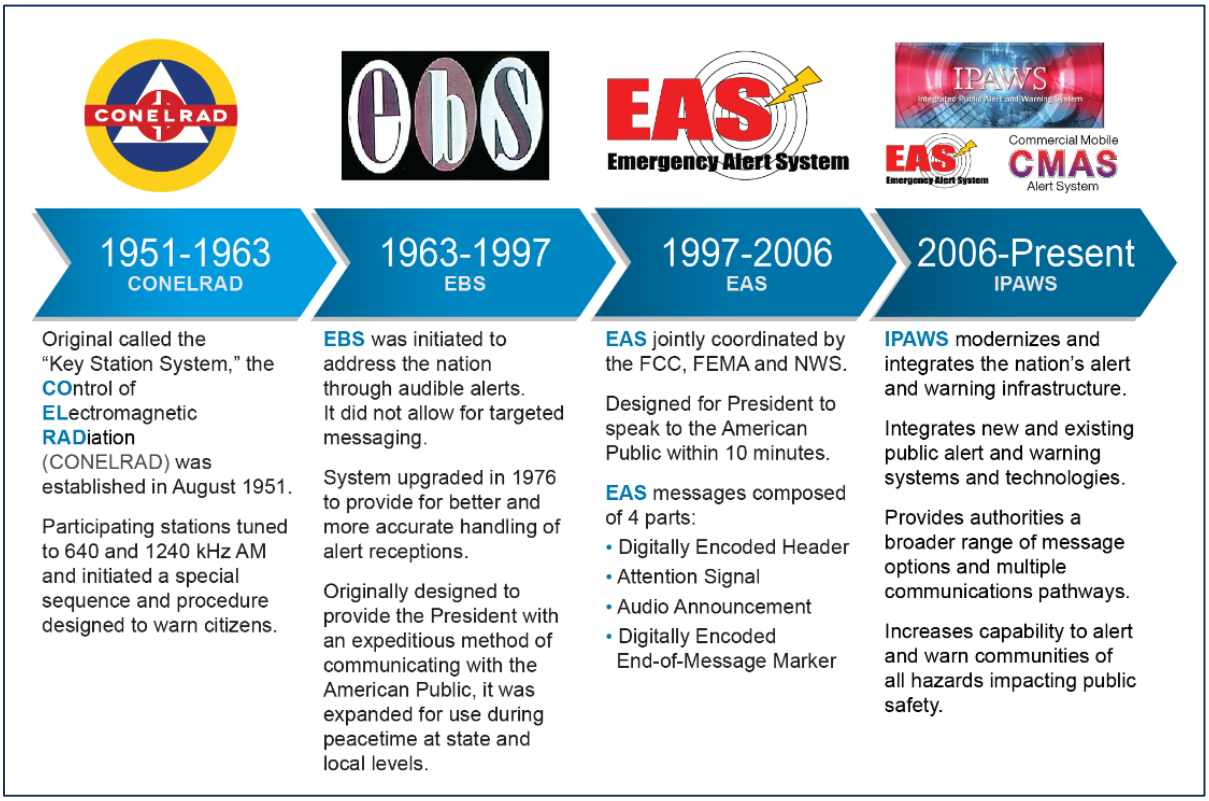

Figure 5: Evolution of Emergency Broadcasting

Over time, these systems evolved to allow for more message flexibility and the ability to target specific geographic areas.

IPAWS in itself is not an alert and notification system. IPAWS is an input service to multiple alert and notification systems (see Figure 6). **This is the power of IPAWS.**

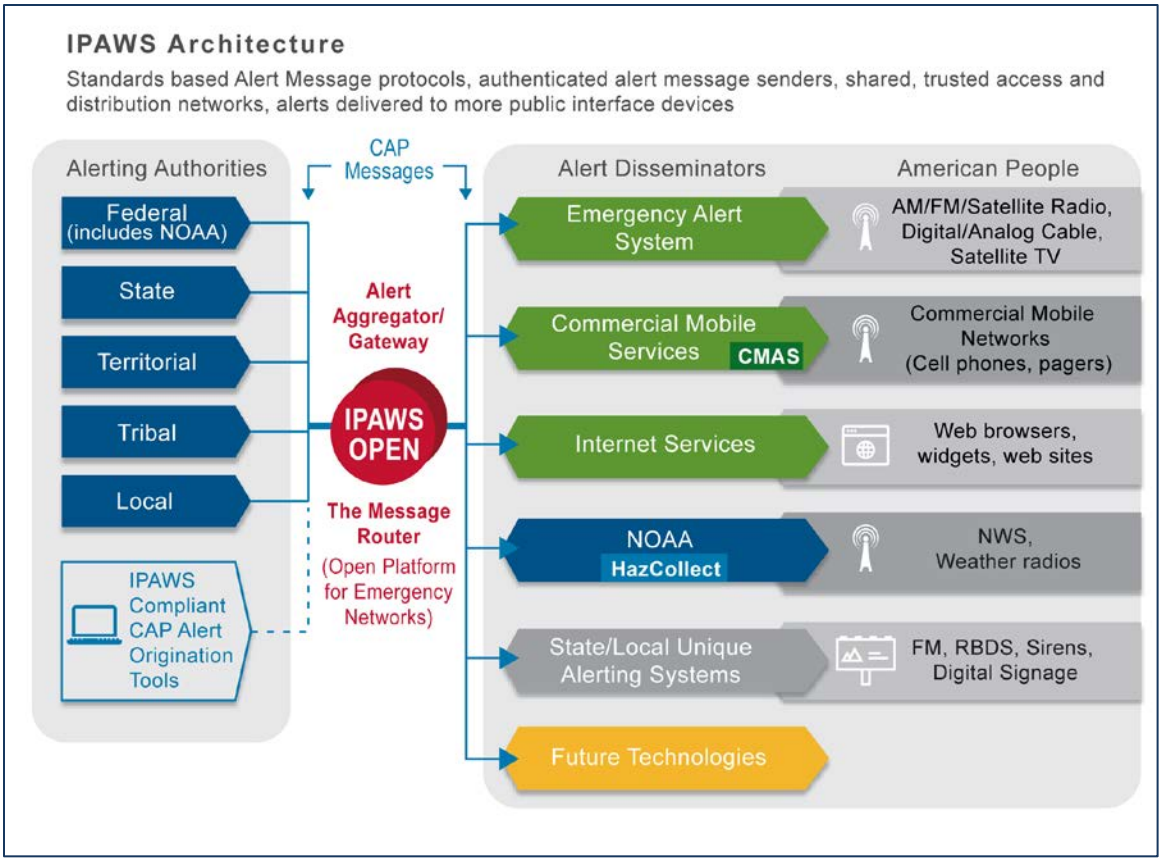

Figure 6: IPAWS Architecture

IPAWS uses open source protocols to receive an alert and/or notification message from an alerting authority and distribute the message to multiple dissemination systems (see Table 1).

Table 1: IPAWS Distribution Methods

System	Distribution	Notes
Emergency Alert System	Pull	Not required to broadcast local messages
Weather Emergency Alert	Push	Limited message length
National Weather Service Radio[3]	Push	Additional permissions required
All Hazards Information Feed	Pull	Varies by systems

[3] As of September 2018, the link to NWEM from IPAWS was not available to local authorities, but work continues. It is in the best interest of the local authorities to monitor this process to gain this capability when it becomes available in the future.

Common Alert Protocol

> *The Common Alerting Protocol (CAP) is a simple but general format for exchanging all-hazard emergency alerts and public warnings over all kinds of networks. CAP allows a consistent warning message to be disseminated simultaneously over many different warning systems, thus increasing warning effectiveness while simplifying the warning task. CAP also facilitates the detection of emerging patterns in local warnings of various kinds, such as might indicate an undetected hazard or hostile act. And CAP provides a template for effective warning messages based on best practices identified in academic research and real-world experience.*[4]

The CAP standard is an internationally recognized standard for information exchange published by the Organization for the Advancement of Structured Information Standards (OASIS). OASIS is a nonprofit consortium that drives development and adoption of open global information standards.

CAP is a set of common published Extensible Markup Language (XML) tags that allow formatting of messages in a common and open format that can then be used by various systems. CAP allows the user to format messages and add links to other information such as audio, video, and pictures.

A CAP message has many available data elements; not all elements are used by IPAWS, and some are required but not used in the published message. Each dissemination channel will have different data elements that are required and used. For example, a WEA message requires a valid severity element but does not use this in the message. WEA does not formally require the use of CMAMtext as part of a CAP <parameter>; however, if it is not used, the 90 characters that are broadcast are derived from other CAP message elements. (See the Message Template Development section of this document for additional information.)

A sample CAP message can be found on the following page (Figure 7).

[4] "Common Alerting Protocol Version 1.2: OASIS Standard." 2010. Accessed online January 22, 2019. http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2-os.html

```
<alert>
   <identifier>MSU-3292aca8-949f-4336-a825-ecf6872a8405</identifier>
   <sender>ClarkCountyEOC</sender>
   <sent>2010-07-20T04:41:00-07:00</sent>
   <status>Actual</status>
   <msgType>Alert</msgType>
   <scope>Public</scope>
   <info>
      <category>CBRNE</category>
      <event>Civil Emergency Message</event>
      <responseType>Evacuate</responseType>
      <urgency>Immediate</urgency>
      <severity>Severe</severity>
      <certainty>Possible</certainty>
      <headline>The danger of further dispersal of the radiation from the initial attacks, or new
         attacks, has passed and further attacks are not anticipated</headline>
      <description>This is a demonstration only message. The danger of further dispersal of the
         radiation from the initial attacks, or new attacks, has passed and further attacks are not
         anticipated at this time</description>
      <instruction>Do not take action based on this message.</instruction>
      <area>
         <areaDesc>National Emergency</areaDesc>
         <polygon>47.57652571374621,-66.884765625 25.562265014427492,-79.892578125
            32.32427558887655,-119.619140625 49.32512199104001,-125.947265625
            49.49667452747044,-97.03125 49.210420445650286,-89.384765625</polygon>
      <geocode>
         <valueName>SAME</valueName>
         <value>011001</value>
      </geocode>
      </area>
   </info>
</alert>
```

Figure 7: Sample CAP Message

IPAWS-OPEN

The IPAWS message aggregator or IPAWS Open Platform for Emergency Networks (IPAWS-OPEN) is operated by FEMA, which provides credentials to authorized alerting authorities. Local jurisdictions also require State approval as an alerting authority. IPAWS-OPEN receives messages from alerting authorities and performs several validation checks on the message.

- Is the message from a valid system? IPAWS-OPEN verifies a valid certificate from the sending device.
- Is the message formatted properly? IPAWS-OPEN validates the message using the CAP v1.2 format.
- Does the authority have permission to send this type of message? IPAWS-OPEN validates the message content and type against IPAWS permissions from the authority's application.
- Does the authority have permission to send to the selected dissemination channels? IPAWS-OPEN validates the message destination against IPAWS permissions from the authority's application.
- Lastly, IPAWS-OPEN verifies the message format for each dissemination channel. Each dissemination channel has different data elements and formatting rules for messages.

After all validations have been successfully authenticated, the message is sent to the dissemination channels.

EAS Feed

The alert authority must be approved to send to the EAS feed, and the message must have an incident type that is approved and listed on the COG agreement. Each message then must also be in an EAS–valid CAP format.

IPAWS will post valid messages to the EAS feed, a secure server where EAS–participating broadcasters can retrieve messages. Each broadcaster is required to have IPAWS–capable equipment to periodically poll the EAS feed for a message and retrieve messages as needed.

Each broadcaster configures the IPAWS–capable equipment at its station to retrieve messages at certain intervals. This interval is recommended to be no more than 2 minutes; most stations set the interval from 30 to 60 seconds.

Broadcasters are only required to broadcast Presidential alerts; local and weather messages are voluntary. The equipment can be programmed to immediately broadcast, ignore, delay, or require a person at the broadcast station to review and take action to broadcast a local or weather message. The message length is usually limited to 2 minutes, but FCC rules permit more. 47 CFR 11.33 states *"Operators shall be able to select a time interval, not less than two minutes."*

Each State must have an EAS plan. This plan outlines the way EAS works in the State and is helpful to developing an effective alert and notification plan. The FCC's list of State EAS Plans and State Emergency Communications Committee (SECC) Chairs webpage is located at https://www.fcc.gov/public-safety-and-homeland-security/policy-and-licensing-division/alerting/general/state-eas-plans.[5]

The EAS CAP message allows the alert authority to include a link to other data, such as pictures and audio recordings. This requires the alerting authority to have a server accessible from the Internet for the broadcaster to retrieve this information. Many IPAWS software vendors include this in their software or service.

The Commercial Broadcaster Capabilities section in this document has additional information on the operation of EAS.

WEA

IPAWS is the only way to send Wireless Emergency Alerts (WEA). The alert authority must be approved to send to the WEA, and the message must have a type that is approved and listed on the COG agreement. Each message then must also be in a WEA–valid CAP format.

[5] Accessed online January 18, 2019.

IPAWS sends the valid message to participating wireless providers. WEA is a voluntary program; while the four major carriers and many small carriers participate in part, not all wireless providers participate. Participating in part is defined as "CMS Providers that have agreed to transmit WEA Alert Messages in a manner consistent with the technical standards, protocols, procedures, and other technical requirements implemented by the Commission in some, but not in all of their geographic service areas, or CMS Providers that offer mobile devices at the point of sale that are not WEA-capable."[6] Alerts are received by participating wireless providers, who process the messages and broadcast to WEA–capable wireless phones.

Participating wireless providers are required to send messages to a county area or larger area based on Federal Information Processing Standard (FIPS) codes and to geo-target alerts to the "best approximate" target area when a polygon location is included. The specific method by which cell towers are chosen for broadcast may differ between carriers.

The FCC will require a Participating CMS Provider to deliver any alert message that is specified by a circle or polygon to an area that matches the specified circle or polygon. A Participating CMS Provider is considered to have matched the target area when it delivers an alert message to 100 percent of the target area with no more than a 0.1-mile overshoot. Participating providers must comply by November 30, 2019.[7]

The WEA message is sent to targeted tower control channels and is not affected by other calls or texts on the system. WEA–capable phones that are connected to a targeted tower's signal will receive a WEA alert. WEA alerts can be re-transmitted at intervals set by the wireless providers, so if a WEA–capable phone enters the geo-targeted area after an alert is first sent, that WEA-capable phone will still be able to receive the WEA for as long as the WEA is active.

Receipt of the message by a specific phone is dependent on the phone being a WEA–capable phone. Each wireless provider lists its capable phones on its website. The phone will also allow a user to turn off imminent threat and AMBER Alert messages but not Presidential alerts. Lastly, a WEA message will not interrupt a call in progress or active data session. On some phones, if a data session is running—even in the background (such as a weather application)—the WEA will not interrupt until the data session has ended, and the WEA is retransmitted.

WEA messages may contain Uniform Resource Locators (URLs) and phone numbers for more information. Local authorities may create a local "active alert" page on their website that can be used to detail information to prepare for and react to emergencies. This site can be used in the public education prior to emergencies and can have an area

[6] FCC 18-4 Second Report and Order. 47 CFR Part 10, Wireless Emergency Alerts. § 10.10 Definitions (l). Accessed online January 18, 2019. (https://www.federalregister.gov/documents/2018/02/28/2018-03990/wireless-emergency-alerts-emergency-alert-system)
[7] Ibid.

for current information that will provide additional details. Creating a short URL that will fit in a WEA message will make it easier to use in messages.

Several new capabilities for WEA are in progress because of FCC Orders and are scheduled to be completed by the end of 2019, including the following:

- Increase message length from 90 to 360 characters (May 2019)
- Add new alert category, "Public Safety Messages," for important information other than emergency alerts and warnings (May 2019)
- Spanish-language support for WEA messages (May 2019)
- WEA local test code that will allow local agencies to test to phones in the field (May 2019)
- Blue Alerts (July 2019)
- Hit 100% target area with 0.1-mile overshoot (November 2019)
- Preserve alerts on phone for 24 hours (November 2019)

The Wireless Provider Capabilities section of this document has additional information on the operation of WEA.

Non-Weather Emergency Messages

The alert authority must be approved to send Non-Weather Emergency Messages (NWEMs) to the National Weather Service (NWS) All-Hazards Emergency Message Collection System (HazCollect), and the message must be of a type that is approved and listed on the COG agreement. Each message must also be in an NWEM–valid CAP format. Alert authorities require additional permissions from NOAA to post NWEM alerts to the NWS radio system. (The Applying for Collaborative Operating Group Status section of this document has application instructions.)

IPAWS sends the CAP message to the NOAA system. Messages are then validated by NOAA, which requires additional location elements that match NOAA areas. This is used to determine the broadcast of the message. Most IPAWS systems that are NWEM–capable will permit pre-validation of these elements. NOAA will then broadcast the message over the NWS radio system.

Some technical issues are being resolved. Due to the duplication of the legacy EAS and the legacy NWS Weather Radio with the IPAWS feed, a chance exists for duplicate messages. As of September 2018, the link to NWEM from IPAWS was not available to local authorities, but work continues. It is in the best interest of local authorities to monitor this process to gain this capability when it becomes available in the future. NOAA has tested some vendor solutions for compatibility, but this list changes often. It will be necessary to ensure your systems are capable and approved by NOAA. Contact the local forecast office or IPAWS Program Management Office (PMO) for status updates or to learn more.

IPAWS All-hazards Information Feed

IPAWS will send messages that are marked "public" to an additional information feed. This feed operates similar to the EAS feed by making messages available to an approved user for retrieval.

Various groups, organizations, and vendors apply for a MOA with IPAWS to gain access to this feed. They then publish the information to their third-party systems such as mapping and alerting services. These systems may be free, such as a mapping website, or subscriber-charged, such as a situational awareness application.

Planning for Alert and Notification Systems

"Failing to plan is planning to fail" — Benjamin Franklin

References

- Developing and Maintaining Emergency Operations Plans, Comprehensive Preparedness Guide (CPG) 101, Version 2.0, November 2010
- Local Emergency Operations Plan
- State EAS Plan
- FEMA IS-2001 Threat and Hazard Identification and Risk Assessment (THIRA) Course
- Census data at https://www.census.gov/
- Code of Federal Regulations (CFR) 47 Part 11 — Emergency Alert System
- CFR 47 Part 10 — Commercial Mobile Alert System

Understanding the Situation

To prepare an effective alert and notification plan, the authority must have a full understanding of the environment in which the authority operates. Every community is different in terms of needs and threats. The best place to start this process is the community's EOP. This plan will include much of the information needed to make decisions in the alert and notification planning process.

Community Threats

The community's EOP will have information on anticipated threats. For alert and notification planning, these threats should be categorized with information on the following:

- **Threat:** The risk must be described.
- **Preparation time:** Does the risk provide advance warning that the event is approaching, such as for a hurricane? Time considerations depend on the nature of the event and should be listed in hours.
- **Onset:** When the event occurs, how much time is available for an alert and notification warning?
- **Geographic Impact Area:** If the event occurs, what is the extent of the area that would be affected?
- **Severity:** If the event happens, how severe is the impact to life and property?
- **Likelihood:** What is the percentage of probability of this risk occurring?

Example Risk Analysis	
Threat:	Tornado in a tornado-prone area
Preparation Time:	0 to 24 hours
Onset:	1 to 15 minutes
Geographic Impact Area:	Path from ¼ to 1 mile wide by ½ to 5 miles long
Severity:	Severe
Likelihood:	99%

Community Populations

Understanding the intended audience will help effective communications and aid in selecting the best application or system for the communication. It is important to understand that, to provide effective communications in an emergency, the user may need to use more than one system.

- **Residents**: Residents, as an audience, are usually not trained, but they often have some knowledge from public education efforts. This audience may be able to understand short messages, such as "SIP" (which means Shelter in Place) based on their knowledge.
- **Visitors**: Visitors, as an audience, usually have no training or knowledge of the area or dangers. This audience will usually need more specific information than a resident.
- **Access and Functional Needs**: Access and functional needs audiences will have similar characteristics as residents or visitors but will require additional considerations during communications. Access and functional needs groups include speech and hearing impaired, non-English speaking, elderly, or youth. Each group may have different needs; understanding the populations within or transiting an area is important when developing messages.
- **Critical Facility Staff**: Critical facility staff, as an audience, usually have the added responsibility of being responsible for infrastructure (e.g., schools, nursing homes, and water treatment plants) or people in their care. This audience will generally need more information than the general public and will often need more time to take necessary actions to save lives and protect property. It takes longer to move 200 people to shelter than a 5-person family.
- **Media**: The media is a conduit to the public and may have additional information needs above what they report to the public. Many reporters try to fully understand the situation to present the information in context and put the information into their own style.

A list of community populations should be developed that includes the following information:

- **Population**: This is the group of people that may be affected by an incident. This group should be segmented by more than just "visitor" or "resident." For example, "visitor" can be someone traveling on a highway or vacationing at a park.
- **Available Communications Media**: This is a list of available media that may reach this group. Communications media can include voice, text, and specific message-dissemination systems like EAS or WEA.

- **Language**: This is the language in which the group is fluent and can include foreign languages as well as American Sign Language (ASL).
- **Notes**: This encompasses other information that may be of importance to the planning process. This can include seasonal information for groups that are in the area only certain times, such as migrant workers, fairs, etc.

Community Capabilities—Alert Technologies

Each available system has advantages and disadvantages. Selecting the proper technology mix to have the best coverage of messages is important. Several currently available systems and their key features are listed in Table 2. These applications can be used as part of an alert and notification plan to send messages based on the availability of the system, the user's ability, and the intended audience.

These communications systems can be one-way or two-way. One-way messages must be very clear and include information that the sender may not use with other communications systems. One-way messages should always clearly state who, what, where, when, and why; use clear and simple language; and include where to get more information.

Table 2: Alert Technologies and Key Features

Applications	Alert (A), Notification (N), or Both (A/N)	Intended User/Audience	Time Frame	Description
Sirens	A	Outdoor and open space public	Immediate	▪ One-way system for alerting the public of emergencies ▪ Limited information available ▪ Must be followed up with where to get detailed information ▪ Visitors may not know what messages may mean
Public Address (PA)	A/N	Indoor and outdoor open space public	Immediate	▪ One-way system for alerting the public of emergencies ▪ Limited information available ▪ Must be followed up with where to get detailed information ▪ Visitors may not know what messages may mean
Tone Alert Radios (TARs)	A/N	Indoor public	Immediate	▪ One-way system that can be used to alert the public ▪ Provides some additional information of actions required ▪ Limited to fixed sites that have these devices

Applications	Alert (A), Notification (N), or Both (A/N)	Intended User/Audience	Time Frame	Description
Emergency Telephone Notification Systems (ETNS)	N	Landline or pre-registered wireless phones	Near-term	▪ One-way system that can be used to notify users of actions needed ▪ Systems are often best effort and have some latency based on the system and usage at the time of use ▪ Transmission of Teletypewriter (TTY) signals required for equal access
Legacy EAS	A/N	Commercial media watching public	Near-term	▪ One-way system for alerting the public ▪ Provides a limited amount of information ▪ Constrained by available types of messages the system allows ▪ Local messages are not required to be broadcast by the media outlets
IPAWS		Various—see below	Immediate	▪ Acts as a gateway to several other alerting methods ▪ Allows users to create a single message that is disseminated via multiple methods
IPAWS–EAS	A/N	Commercial media watching public	Near-term	▪ One-way system for inputting messages to other systems ▪ Used for alerting the public and providing a limited amount of information ▪ Constrained by available types of messages the system allows.
IPAWS–WEA	A	Wireless phone public	Immediate	▪ One-way system for alerting the public ▪ Provides a limited amount of information ▪ Constrained by the available types of messages the system allows ▪ Uses cellular radio broadcast of a short text to wireless phones and, as such, may reach visitors more easily ▪ Not all phones receive these messages ▪ The public can disable this from their phones

Applications	Alert (A), Notification (N), or Both (A/N)	Intended User/Audience	Time Frame	Description
IPAWS–NWEM[8]	A/N	Weather radio users	Immediate	▪ One-way system for alerting the public ▪ Allows more detailed information ▪ Constrained by available transmitters in the area ▪ Public must tune to these stations ▪ Added benefit of using weather radio county codes for notifications
IPAWS–All-Hazards Information Feed	N	Private service users	Near-term	▪ Used by several commercial systems ▪ Include popular mapping and search engines and commercial alerting services
Highway traffic radios	A	Traveling public	Near-term	▪ One-way system for alerting the public ▪ Allows more detailed information ▪ Constrained by available transmitters in the area ▪ Public must tune to these stations
Alert translation services	A/N	Non-English Speaking/Deaf and Hard of Hearing Public	Near-term	▪ One-way system usually accepts the IPAWS feed ▪ Translates to ASL or other languages and then posted to a public website or sent via ETNS
Roadside message boards	A	Traveling Public	Near-term	▪ One-way system for alerting the public ▪ Provides a limited amount of information ▪ Constrained by size of the sign and ability of a driver to read the sign
Route alerting	A/N	Public in fixed locations along the route	Near-term	▪ Generally, a one-way system for alerting the public along a route ▪ Takes time and resources to cover relatively small areas ▪ Sound (e.g., sirens) may not penetrate modern buildings

[8] As of September 2018, the link to NWEM from IPAWS was not available to local authorities, but work continues. It is in the best interest of the local authorities to monitor this process to gain this capability when it becomes available in the future.

Applications	Alert (A), Notification (N), or Both (A/N)	Intended User/Audience	Time Frame	Description
Cable system interrupt	A/N	Cable viewers	Immediate	▪ One-way system for alerting the public ▪ Allows more detailed information ▪ Constrained by the available access ▪ Being replaced by other more-focused systems as cable system areas expand
Social Media	N	Internet Connected Public	Delayed	▪ Used to provide information to the public and sample public reactions ▪ Can help reduce rumors ▪ Can be used in some cases as a method to get reports from the public
Press Release	N	Media	Delayed	▪ One-way system that allows for more information to be sent to the media ▪ Information is sent, but that does not mean it will be relayed to the public
Press Conference	N	Media	Delayed	▪ Two-way system that allows the media to give feedback and expand their understanding of the situation ▪ Not all information may get to the public

Commercial Broadcaster Capabilities

Commercial broadcasters are not required to broadcast local alerts. It is important for the alerting authority to understand the plans and systems of the local broadcasters with which they work. Often, these broadcast areas cover multiple jurisdictions and cannot deliver messages to sub-county or small areas. All messages are broadcast to the entire broadcast area. Broadcasters include television, radio, cable television systems, and satellite.

When an EAS is sent, the broadcaster may broadcast a message of 2 minutes once. The message will not be repeated. Some major broadcasters with multiple stations have stated they will not send local messages.

In the legacy EAS system, messages were pushed to broadcasters over the radio in most cases. The messages are pushed from an origination source such as the Federal Primary Entry Point (PEP) stations or a local State Primary (SP) or Local Primary (LP) station.

Each message was pushed to an expanding chain of stations, and each broadcaster is required to monitor two stations up the chain in accordance with the State EAS Plan.

With IPAWS, broadcasters pull messages directly from the IPAWS-OPEN feed. The broadcaster's equipment polls IPAWS-OPEN for new message headers on a periodic basis set by each broadcaster. If the equipment identifies a message header that is targeted within the broadcaster's area(s), the equipment will then request the full message.

The alerting authority should identify the broadcasters that service the jurisdiction and other information such as the following:

- Contact information (24 hours, 7 days)
- Technical contact for system configuration and troubleshooting
- Configuration of EAS equipment, including the following:
  - Source feeds monitored
  - Rebroadcast methods per event type allowed to alerting authority (automatic, manual, none)
  - Time duration between polls of the IPAWS feed to pull alerts
- How station equipment processes messages

Appendix E: Model EAS Survey Form contains a model EAS survey form that can help collect some of this information.

Commercial broadcasters are also working on advanced methods to deliver emergency information to the public using digital over-the-air technologies that are being adopted. Information on the Advanced Warning and Response Network (AWARN) Alliance and its activities can be found at http://awarn.org/.

Wireless Provider Capabilities

Participating wireless providers are required to broadcast valid messages that are sent by public safety officials and delivered by IPAWS-OPEN. The message is pushed to participating wireless providers by IPAWS-OPEN. The wireless provider then processes the message to determine the targeted towers to send the message for distribution. The wireless provider's system sends the message to targeted towers and then sends the message to handsets on its network that are connected to the targeted towers.

Providers are required to deliver messages to an area that "best approximates" the target area based on a provider's available technology. By the end of 2019, messages should be delivered to 100 percent of the target area with less than 0.1-mile overshoot. The CAP area element includes a geographic polygon created by the sender. When an alerting authority adds an area element to the CAP message, wireless providers use that element to determine the target towers to which to send the message.

The provider examines the message and applies the provider's processes to the message to determine where to send the message. The process followed by providers to determine which towers varies by provider but falls into three methods currently.[9]

Method 1

All towers that are physically located within the alert area are selected to broadcast the message (see Figure 8). Depending on the location of the towers, this can lead to not alerting a large area and alerting some areas that are not at risk.

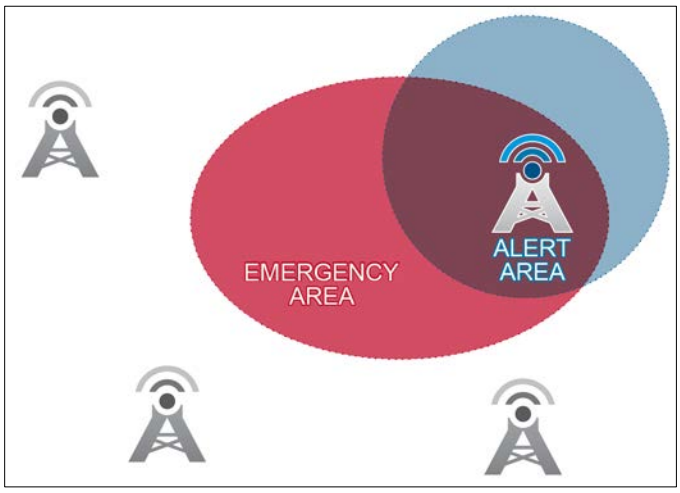

Figure 8: Wireless Provider Capability Method 1

Method 2

All towers that have a coverage area that is within the alert area are selected to broadcast the message (see Figure 9). Depending on the location of the towers, this can lead to alerting large areas that are not at risk and not alerting some at-risk areas.

[9] A fourth method is in development and may be the solution to meet the FCC requirements of delivering an alert message to 100 percent of the target area with no more than a 0.1-mile overshoot by November 30, 2019. This method involves software on the phone receiving the message and determining if the phone is in the impacted area before alerting the user.

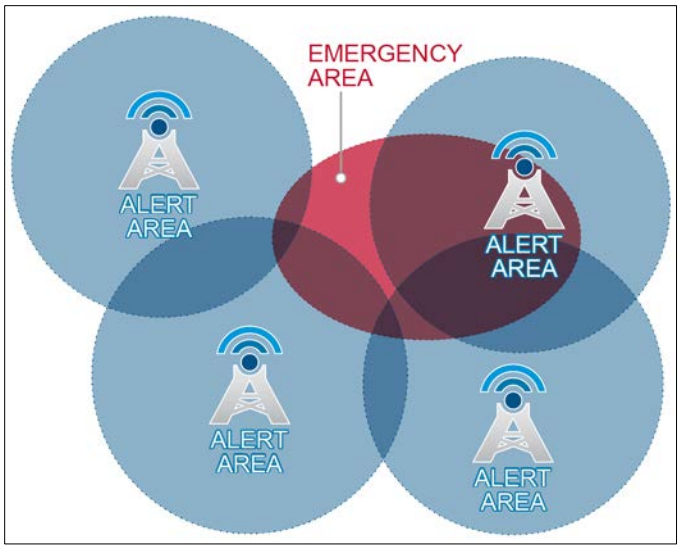

Figure 9: Wireless Provider Capability Method 2

Method 3

All sectors that have a coverage area within the alert area are selected to broadcast the message (see Figure 10). Depending on the location of the towers, this can lead to alerting areas that are not at risk and not alerting some areas that are at risk.

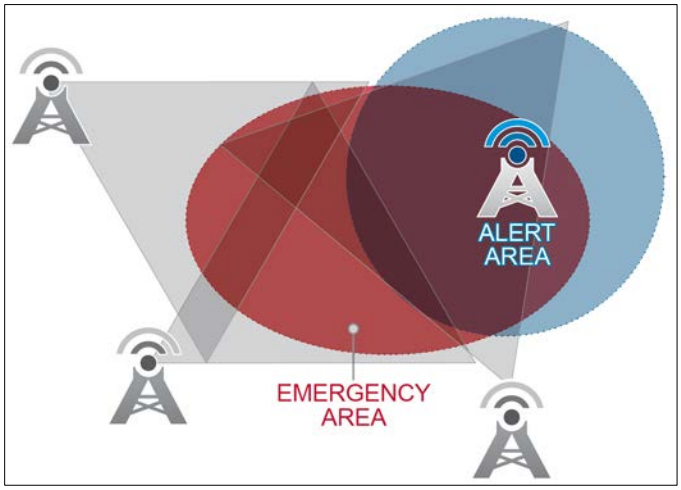

Figure 10: Wireless Provider Capability Method 3

Handset Method

A fourth method is in development and may be the solution to meet the FCC requirements of delivering an alert message to 100 percent of the target area with no more than a 0.1-mile overshoot by November 30, 2019. This method involves software on the phone receiving the message and determining if the phone is in the impacted area before alerting the user.

The wireless provider broadcasts the message to phones connected to the towers selected. This transmission uses control systems and is not affected by traffic on the system. If a person's phone is currently in use—including voice calls or data sessions—during the broadcast, the message may not be received, even if that session is in the background.

The wireless provider can set the system to automatically re-transmit the message at set times if the duration of the message is still valid. The interval of any re-transmission may vary from provider to provider.

It is important to understand that the WEA system uses cellular broadcast technology and radio transmissions and will not provide a specific addressable location capability. Wireless providers' radio systems are continually being adjusted to provide coverage; consequently, radio power, coverage, and availability change frequently. There will always be some dead spots and some over-alerting by the nature of the system.

Understanding the location of towers and how they will send messages aids the alerting authority in developing the alerting plan and procedures to use IPAWS. See Appendix F: Model WEA Survey Form. Most of this information should already be available to the 9-1-1 authority.

Authority

Research on State and local authorities for alerting and delivering messages to the public should be conducted. Authority may not be listed as a clear role in State or local statues or rules but can often be derived from the highest elected official in most cases as a default.

Once the alerting authority is established, determine if that authority has been delegated. Some States will delegate the authority to alert the public from the governor to an agency or the secretary of a cabinet-level agency.

Once existing lines of authority are documented, State and local governments should determine the best method to alert the public. Some questions to ask when determining this are as follows:

- Who can make the determination of when to alert the public?
- Who can determine what message to use to alert the public?
- Who has access to the equipment needed to alert the public?
- Who will be available on a 24-hour basis to alert the public?
- What are the lessons learned from past experiences?

Once a determination of the best way to alert the public has been made, the person or agency with authority should delegate that authority in writing. This can be done with specific guidelines or policies that can include the following:

- Ability or non-ability to further delegate

- When the authority can be used
- What actions can be performed with the authority
- Specific roles and responsibilities of all involved with the alerting process from the request to the operator of the alerting tools
- What notifications must be made if authority is used

Additional information on policies and procedures can be found in the Develop Policies, Procedures, and Guidelines section of this guide.

When delegating authority, it is often best to delegate to a position or agency within the organization, such as the director of communications, rather than a specifically named person. This will provide better succession abilities in the future.

IPAWS Authority

Development of IPAWS added another level of authority to the environment. IPAWS was developed to allow for national command alerting but has been made available to State, Territorial, Tribal, and local governments.

To gain access, the State or local entity must enter into an agreement with FEMA; requests by local governments must be approved by the State. This process grants the State an additional responsibility and authority over the use of a specific alerting technology.

Goals and Objectives

As a community begins the planning process, identifying why the plan is needed is important. Developing a plan just to have a plan and then put on the shelf a waste of time and resources. A good plan must have a clear purpose defined by the goals and objectives that drive the planning process. The *Developing and Maintaining Emergency Operations Plans: Comprehensive Preparedness Guide* defines goals and objectives as:

> Goals *are broad, general statements that indicate the intended solution to problems identified by planners during the previous step. They are what personnel and equipment resources are supposed to achieve. They help identify when major elements of the response are complete and when the operation is successful.*
>
> Objectives *are more specific and identifiable actions carried out during the operation. They lead to achieving response goals and determining the actions that participants in the operation must accomplish. Translating these objectives into activities, implementing procedures, or operating procedures by responsible organizations is part of planning. As goals and objectives are set, planners may identify more requirements that will feed into the*

development of courses of action as well as the capability estimate.[10]

Example Goals and Objectives

Goal 1: Alert the residents of the county of impending or ongoing emergency.
Objective 1.1: Activate appropriate Tone Alert Radios within 2 minutes of determination of risk
Objective 1.2: Notify School district by radio within 2 minutes of determination of risk

Setting goals and objectives is based on the environment, the community, and the resources available. Some communities, such as Chemical Stockpile Emergency Preparedness Program (CSEPP) communities, may have goals established based on the risks. Other communities, such as Radiological Emergency Preparedness Program (REPP) communities, may have goals established by Federal rules.

Questions to ask when developing this section include the following:

- What are the threats to the community?
- What are the populations of the community?
- What is the availability of alerting systems in the community?
- Are there any prescribed goals for the identified threats?
- What objective will accomplish the goals?

Plan Development

After gathering an understanding of the current situation and setting goals and objectives, a plan will be developed to accomplish goals and objectives in the current environment. It is important to base the plan on the current situation. Plans that include systems or situations that do not exist today will adversely affect the ability to use the plan. A draft plan can be developed to plan for incorporating new technologies such as IPAWS.

Plans are living documents and should be reviewed, updated, and improved over time. The plan should have a scheduled review timeframe, and new systems should be added to the plan as needed but not until the new systems are available.

Components of an IPAWS Plan

The components of an alert and warning plan should include the following:

- Introductory material
- Situation, authority, and purpose
- Alerting plan detail
- Roles and responsibilities
- Appendices

[10] Federal Emergency Management Agency. 2010. *Developing and maintaining emergency operations plans: Comprehensive Preparedness Guide (CPG) 101*, version 2.0 (page 4-12).

See Appendix H: Model Alert and Notification Plan. Additional examples and information can be found at www.fema.gov/informational-materials.

Introductory Material

The introductory material establishes the plan as an official document and provides a summary of the document. This section consists of the following:

- **Promulgation Document/Signature Page**: The promulgation document is usually a cover letter from the alerting authority that adopts the plan and gives the plan a legal basis.
- **Record of Change**: The record of change is used to track the date, reason, and a summary of what has changed over time.
- **Executive Summary**: The executive summary is a high-level summary of the plan that covers the basic plan and authority. The executive summary will also be the cover page that includes the information that the alerting authority has adopted the plan.
- **Table of Contents**: The table of contents is a reference to guide the reader to sections of the plan.

Situation, Authority, Purpose

- **Situation**: The Situation section should be a brief summary of the current environment. Some detail can be included in appendices to the plan such as contact information and systems inventories. This is all part of "know your community" (Figure 11).

Figure 11: Know Your Community

- **Purpose**: The Purpose section outlines the reasons the plan was developed. This section will include background, purpose, and goals.

- Questions to ask when developing this section include the following:
  - What is the background of alerting in the jurisdiction?
  - Why is this plan needed?
  - What are the goals of this plan?

- **Goals:** The Goals section describes what the plan is expected to accomplish in general terms.
- **Objectives:** The Objectives section defines the way that the goals will be accomplished.

Alerting Plan Detail

The plan detail is the main section of the document. This section will vary widely from community to community. This section contains the details of who, what, and when IPAWS is used in the jurisdiction. The following information can be used to develop this section:

- What criteria are used to determine when to send an alert?
- What types of messages are permitted?
- What are the training requirements?
- What tools are to be used?
- What are the system security requirements?
- When and what can be tested and how?
- What coordination or outreach to the public and media is permitted?
- What is the process to activate alerts?

Roles and Responsibilities

The roles and responsibilities of each level of jurisdiction are described and/or defined, including the following:

- Each level of jurisdiction
- Roles of each jurisdiction
- Responsibilities of each jurisdiction
- Restrictions of each jurisdiction

Plan Maintenance

One of the major responsibilities is review and maintenance of the plan. There should be a section describing the process used to keep the plan current, including the following information:

- How often the plan is reviewed
- Who has responsibility for reviewing

- How an entity submits changes

Appendices

Appendices should contain additional information that is relevant to the plan or that may be needed for the plan, including other plans that may be relevant to IPAWS. Appendices can include the following:

- A table of acronyms and glossary
- Descriptions of the architecture of the alerting systems in the jurisdiction
  - Types of alerting systems used to generate alerts
  - Type of systems used to disseminate messages to the public
  - Detailed method for distributing wireless system messages
- Alert and notification capabilities—list all broadcasters, wireless providers, and other capabilities to provide alert and notification in the jurisdiction
- Example or sample messages and templates
- IPAWS application procedures
- Statewide EAS plan
- MOU from NWS for use of NWS radio for civil emergencies
- MOU from transportation agency for access to highway signs for alerts and notifications

If the plan is large and given the nature of the technology-centered systems for which the plan is in place, an acronyms list and glossary should be included. This section(s) lists acronyms and terms used in the plan, can be a single section or split into two separate sections, and can be an appendix or go before the appendices.

Shared Use and Memorandums of Understanding

IPAWS was developed primarily to provide a national system for Presidential messages, but the system is available to State, Territorial, Tribal, and local entities. The current rules provide access to IPAWS at the county level. Many large cities that do not represent entire geographical counties also benefit from access. In addition, many incidents, such as a flood or wildland fire, extend beyond a single county or jurisdiction. Jurisdictions can also share resources and provide alerting for other jurisdictions. An MOU provides these abilities to the jurisdiction.

Purpose

An MOU template has been created as a tool for States and counties to develop agreements with neighboring jurisdictions for the purpose of using IPAWS to notify the public of emergency incidents and protective actions. This template can be modified in any way to address local situations to provide the best service to the public and responders.

An MOU should be developed for each county or entity that is an approved COG with IPAWS. This will allow the IPAWS PMO to correctly set up the permissions for the COG in IPAWS-OPEN.

References

For help developing an MOU, refer to the following documents:

- Writing Guide for a Memorandum of Understanding (MOU) by SAFECOM[11]
- Appendix I: Model Memorandum of Understanding Template (this document)
- IPAWS Rules of Behavior
- Code of Federal Regulations (CFR) 47 Part 11—Emergency Alert System[12]
- CFR 47 Part 10 — Commercial Mobile Alert System[13]

MOU Components

- **Introduction**: The Introduction section describes the reason for the MOU and will serve as a background of the situation that leads to the development of the MOU. The introduction is intended to provide a high-level summary of the MOU. The following questions can guide development of the introduction:
  - Why is this MOU being created, what is the need being addressed, and what is the background?
  - What agencies are participating in the MOU?
  - Why is this MOU necessary?
  - What agreements are set forth by this MOU?
- **Purpose**: The Purpose section is a concise statement of the intention of the MOU. It explains how the agencies involved will use the MOU and under what circumstances. The following questions can guide development of the purpose:
  - When will it be used?
  - How will it be used?
- **Scope**: The Scope section describes the specific extent of the MOU. It lists the agencies and jurisdictions included in the agreement and describes their relationship. The following can guide development of this section:
  - Contact information for all parties
  - List of FIPS codes of the entity

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[11] https://www.dhs.gov/sites/default/files/publications/Writing%20Guide%20for%20a%20Memorandum%20of%20Understanding_0.pdf (accessed January 22, 2019)

[12] https://www.govinfo.gov/content/pkg/CFR-2009-title47-vol1/pdf/CFR-2009-title47-vol1-part11.pdf (accessed January 22, 2019)

[13] https://www.govinfo.gov/content/pkg/CFR-2013-title47-vol1/pdf/CFR-2013-title47-vol1-part10.pdf (accessed January 22, 2019)

- List of authorized event codes allowed by the entity
- Specify when the MOU is in effect
- Description of the limits to using the system
- For local users, description of what is needed for State approval

- **Definitions**: The Definitions section describes the terms and acronyms used in the MOU and for the operation of the systems of the MOU where coordination is required.
- **Policy**: The Policy section describes the operation of IPAWS to which the MOU is agreeing. This is a high-level description of the intent and operation of the systems. The following questions can guide development of this section:
  - Who can use the system?
  - What is permitted to be done on the system?
  - Which event codes can be used?
- **Procedures**: The Procedures section describes in detail the steps each participant takes to operate in compliance with the policy. This is detailed in step-by-step instructions.
- **Changes to MOU**: The Updates section describes the process of maintaining the MOU over the period of the agreement. The following questions can guide the development of the Updates section:
  - How can the MOU be modified?
  - How can the MOU be cancelled?
  - If only one party of an MOU among three or more parties wants to cancel, what happens to the MOU?

Appendix I: Model Memorandum of Understanding Template contains an example MOU as a reference.

Procuring Alerting Technologies

Our Age of Anxiety is, in great part, the result of trying to do today's job with yesterday's tools…" — Marshall McLuhan

References

- Developing and Maintaining Emergency Operations Plans, Comprehensive Preparedness Guide (CPG) 101, Version 2.0, November 2010
- Local Emergency Operations Plan
- FEMA IS-2001 Threat and Hazard Identification and Risk Assessment (THIRA) Course
- Census data at https://www.census.gov/
- FCC CSRIC IV WG3 EAS Security Subcommittee Initial Report May 2014

Alert and Notification System Selection Considerations

The selection of alert and notification systems should be based on information gathered during the planning process. Risks and community information will drive the alert and notification systems that are needed. In most cases, this will be a group of tools and systems that are used to notify various audiences.

Another consideration when selecting alerting tools is whether a physical system or a hosted solution best meets needs. Both options are effective but will not work for all agencies. For example, within the CSEPP community, a few counties were interconnected to physical radio transmitters to deliver alerts to the public. A hosted solution was not able to be interconnected to these radios.

Table 3 lists some advantages and disadvantages of hosted and physical.

Table 3: Alert and Notification Systems: Pros and Cons

	Advantages	Disadvantages
Hosted	▪ Maintained by hosting provider ▪ Accessible from almost anywhere ▪ Low capital costs	▪ Controlled by third party ▪ Requires Internet or other access ▪ High operational costs
Physical System (Hardware)	▪ Can be interconnected to other systems (e.g., radios) ▪ Controlled by agency ▪ Low operational costs	▪ Requires maintenance by agency staff ▪ System redundancy can increase costs ▪ High capital costs

Whenever a system is selected, discussions should be had regarding its purpose and how the system can be measured to determine its effectiveness. Various systems have

different target audiences; as such, a variety of measures will need to be placed to determine the effectiveness of alert and notification messages.

IPAWS System Considerations

CSEPP communities have unique alerting needs due to the congressional mandate to provide "maximum protection" to the public. To improve system confidence and to achieve better information on how IPAWS functions, testing was planned, and a test plan developed. Testing of CSEPP's use of IPAWS was executed on December 8 and 9, 2014. Information on the systems used by the participating sites as well as how IPAWS processes the messages was collected. Some issues encountered during testing are described below[14] and should be given consideration when selecting an alert and notification system.

- Applications took the time from the local device, not a network source. This resulted in several message failures, as the times of the CAP message were outside allowable parameters of IPAWS-OPEN. The device time was changed, and the issue was resolved.
- The use of default settings, including default end-dates, durations, and text from previous messages, was an issue. Some systems kept text from the previous messages and prepopulated a message. This resulted in duplicate messages or messages with a duration of 23 hours during testing. Users must carefully review each element.
- Issues with cutting and pasting text into the IPAWS applications were identified in pre-testing preparation. In the preparation phase, a test found that bullets were not acceptable characters. During testing, it was found that other formatting issues in some word-processing programs may affect message text. Using a text editor to remove special format and characters worked in some cases, but caution should be used, as some web browsers may add formatting to the text that is not visible to the user.
- Some systems are designed to generate a message for only one distribution channel at a time. To test all channels, a message for each channel had to be created by the user.
- A major issue was the ability to cancel or update a message. Only two of the four systems tested provided the ability to cancel or update a message. A third vendor had this feature in beta testing and said that the cancel could be performed by editing the CAP message in an editing module. This was labor-intensive, required technical knowledge of the CAP format, and was not able to be done in an actual message by a typical user.

The interface that the system operator uses can also affect the system selected. Some advantages and disadvantages of simple and complex user interfaces are listed in Table 4.

[14] The complete test report can be found at www.cseppportal.net.

Table 4: Simple and Complex Interfaces: Pros and Cons

	Advantages	Disadvantages
Simple Interface	▪ Easy for users to create messages ▪ Pre-populated fields ▪ Less system knowledge needed to use application ▪ Easier to train users ▪ Less risk of errant alerts	▪ Fewer functions available to the user ▪ Limited availability of log files ▪ Troubleshooting available to the user may be limited
Complex Interface	▪ Many functions available to the user ▪ Detailed logs containing messages sent and responses are available to the user for troubleshooting	▪ Requires more training ▪ Difficult to operate (many fields or pages) ▪ Users need to understand the application as well as the operation of IPAWS and legacy EAS ▪ High risk for errant alerts

The following suggestions for vendors arose during the after-action review:

- The system(s) should be able to do the following:
  - Synchronize time from a master clock or IPAWS-OPEN and not the user's device to ensure times attached to messages are valid.
  - Provide validation of polygons for IPAWS and the distribution channel before they are sent to IPAWS-OPEN.
  - Provide text validation to ensure that there are no improper or invisible characters in the message text.
  - Include a message cancel and/or update function.
  - Allow users to see the message status without having to refresh the page.
  - Eliminate the need to create the same message for each dissemination pathway.
  - Allow the user to retry a message to a failed path when posting a message failed with HTTP errors (e.g., 503 service temporarily unavailable).
- Easier-to-understand user manuals, job aids, and refresher training should be developed.

These items should also be given consideration when selecting an alert and notification system.

Functional Requirements

A functional requirement is a statement of a specific function that a system or device must or should do. Functional requirements are used for various reasons, including the following:

- Developing a new device or system

- Testing a device or system
- Procuring a device or system

Functional requirements should be developed based on intended or expected functions that the authority needs. These requirements are based on the risks, populations, goals, and objectives developed above. To be effective, these requirements should have the following attributes:

- **Clear**: Each requirement should be a single complete action or function, and the reader should be able to draw only one interpretation of it. Other readers of the requirement should arrive at the same interpretation. Subjective words and terms such as *user-friendly, easy, simple, rapid, efficient, several, state-of-the-art, improved, maximize,* and *minimize* should be avoided. Requirements should use simple, straightforward language and not jargon or slang.
- **Verifiable**: Devise tests or use other verification approaches, such as inspection or demonstration, to determine whether each requirement is properly implemented in the product. If a requirement is not verifiable, determining whether it was correctly implemented is a matter of opinion. Requirements that are not consistent, feasible, or unambiguous also are not verifiable. Any requirement that says the product shall "support" something is not verifiable.
- **Feasible**: It must be possible to implement each requirement within the known capabilities and limitations of the system and its environment. To avoid infeasible requirements, have a developer work with the requirements analysts or marketing personnel throughout the elicitation process. This developer can provide a reality check on what can and cannot be done technically, and what can be done only at excessive cost or with other tradeoffs.
- **Necessary**: Each requirement should document something the customers really need or something that is required for conformance to an external requirement, an external interface, or a standard. Another way to think of *necessary* is that each requirement originated from a source you recognize as having the authority to specify requirements. Trace each requirement back to its origin, such as a use case, system requirement, regulation, or some other voice-of-the-customer input. If you cannot identify the origin, perhaps the requirement is an example of "gold plating" and is not necessary.

Appendix D: Model IPAWS Requirements Document contains an example document.

CSEPP IPAWS Alerting Tool Requirements

The IPAWS Working Group of the Automation Integrated Process Team (IPT) developed a list of requirements for IPAWS alert authoring tools for use by CSEPP communities. Each jurisdiction may use this list to develop specifications that meet its specific need(s). This list is not intended to be requirements on the jurisdiction. The list is categorized in the following levels:

- **Primary Requirements**: These are features that should be required for all systems.

- **Secondary Requirements**: These are preferred for all systems but are left to a local jurisdiction's decision.
- **Nice-to-Haves**: These are recommended additional features based on a jurisdiction's specific needs.
- **Optional**: These are left to a jurisdiction to determine its local needs.

Primary Requirements

- General requirements:
  - Meets industry and federal standards for Common Alerting Protocol (CAP) authoring tools and user accessibility
  - Complies with Communications Security, Reliability and Interoperability Council (CSRIC) Emergency Alert System (EAS) security best practices
- System configuration requirements:
  - Supports multiple user names
  - Has administrator-defined user permissions
  - Supports multiple permission levels
  - Allows alert distribution channels to be configured per user
  - Supports at least two collaborative operating groups (COGs) (Live and Test)
  - Limits pull-down lists by allowable elements
  - Is system-configurable to default to the test COG
  - Sends CAP– and IPAWS–compliant messages to production and test IPAWS-OPEN
  - Is tested, with proof of messages through IPAWS-OPEN to all available distribution channels (EAS, WEA, All-Hazards Feed, COG-to-COG)
  - Logs all activities automatically
  - Provides legal record of activity log(s)
- System features requirements:
  - Supports printing
  - Supports master timing source
  - Supports multiple pre-planned message templates
  - Supports multiple pre-planned polygons
  - Logs off user for inactivity automatically
  - Continues to operate when logged off
  - Provides text-to-speech with custom dictionary

- User features requirements:
  - Provides visual alerts for required CAP elements
  - Previews message to user
  - Presents message elements in pull-down list
  - Supports the ability to select multiple area polygons
  - Generates area polygon from internal mapping function
  - Identifies COG clearly on page
  - Switches between COGs without restarting the system
  - Validates automatically CAP elements based on COG permissions and IPAWS rules
  - Provides audio preview to user
  - Completes CAP elements from COG data
  - Displays errors and solutions for CAP elements
  - Configures based on selected distribution channel
  - Displays the message text when sending the alert, and requires verification that the user wants to send
  - Displays to user IPAWS-OPEN status messages, to include explanation text
  - Provides easy access to message log with a search/filter function
  - Retrieves sent message and sends cancel or modify messages to IPAWS-OPEN
  - Has ability to attach files to message
  - Supports import of .SHP and .KML files
  - Has user training
  - Has system administrator training

Secondary Requirements

- Posts to social media
- Posts to email
- Posts to text message
- Supports the ability to select multiple messages
- Generates and imports area polygon from external mapping function
- Monitors alerts from other COGs
- Holds at least 6 months of data in log and is able to query data and run ad hoc reports
- Has IPAWS test lab component of training

- Has web, computer, and video refresher training
- Has train-the-trainer training
- Provides service-trouble-reporting process and escalation plan

Nice-to-Haves

- Connects external devices such as lights and display boards
- Allows all configuration by keyboard
- Uses sub-FIPS codes
- Checks polygons for wireless provider towers
- Supports more than two COGs
- Records audio from message page
- Displays carrier and towers in alert area(s)
- Displays if a carrier is not included in alert
- Relays alerts from other COGs
- Has exportable log
- Generates scheduled reports
- Prints reports to printer and electronic file
- Is able to email reports
- Provides 24-hour, 7-day, 365-days-a-year phone support

Optional

- Supports simultaneous user access from at least two remote sites
- Sends legacy EAS alerts to local radio transmitter
- Provides system and/or software updates and upgrades for __ years
- Provides backup of all data
- Has refresher training on systems and new features and/or functions

Procurement Methods

Once specifications of needed functions are determined, there may be a need to procure one or multiple systems. It is important to follow procurement requirements of your agency. These systems can be capital expenditures for fixed equipment or operational expenditures for maintenance or a service.

Table 5 lists methods to procure systems:

Table 5: System Procurement Methods

Method	Use
Request for Proposals (RFP)	An RFP will usually allow for an assessment of a proposed solution in a holistic approach. This allows the entity to review the best solution for its needs and not rely solely on price. This method is best for complex systems with multiple different solutions, components, or options.
Request (or Invitation) for Bid (RFB or ITB)	An ITB will usually require the entity to select the lowest cost proposal. This is used for procurement of items that are commodities rather than complex systems. This is best for items that can be very clearly defined.
Series of proposals	Pre-identifying a series of vendors that offer the solution and requesting proposals from these is allowed in some jurisdictions. This is usually used for lower-cost solutions. Many jurisdictions place a maximum value where this can be used. This is best for non-complex systems or components.
Direct procurement (Sole Source)	Direct procurement is allowed in some jurisdictions. This is used when an entity has a clear idea of the solution. Caution must be used with this method to make sure this solution will meet the needs. This is best used when there are clear specifications and the solution meets the specifications or a specific solution is required due to constraints with other systems.

Calculating Cost of Ownership to Determine Sustainability

Many local governments and public-safety agencies use Federal grant funds to implement technology that aligns with short- and long-range planning goals to the benefit of their constituents. During a time when most local governments face budget cuts, grant funding often provides needed resources. A recurring question is: What happens when grant funding ends? Many agencies do not fully realize the total costs of ownership and may find it difficult to sustain the investment already made or to budget appropriately.

Examining the total cost of ownership and an entity's ability to sustain a system when funding ends is imperative. Total cost of ownership, simply put, is a financial estimate whose purpose is to help consumers determine direct and indirect costs of a system or product. Sustainability has multiple meanings, but for this purpose means "the ability to maintain or support."

Total cost of ownership attempts to measure the financial impact of implementing a technology over its life cycle, which may be 5 years or more. It will also be necessary to include a percentage for cost increases. For example, there may be an initial cost, monthly or annual maintenance, connectivity, database maintenance, and interface costs to add IPAWS to an existing emergency notification system.

To determine the total cost of ownership, the steps below should be followed.

Step 1: Identify the Costs of the Solution

- What are the one-time costs (equipment, software, or connectivity)?
- What are the recurring costs (licenses fees, services, maintenance)?

In the example above (i.e., adding IPAWS to an existing emergency notification system), the following one-time and recurring costs were identified (Table 6). (Note: costs used in the simplified example below are not actual and are used strictly to show calculations; numbers are rounded to the nearest dollar when necessary.)

Table 6: Costs for Adding IPAWS to an Existing Notification System (Example)

	Cost	One-Time	Recurrence
Initial equipment cost	$35,000	✓	
Non-recurring network expense	$600	✓	
Monthly charge	$1,200		Monthly
Annual maintenance	$13,200		Annually
Interface	$1,000		Monthly
Database maintenance	$500		Monthly

When calculating total costs, there are numerous aspects to consider, including the following:

- Technology
  - Network, server and workstation hardware and software
  - Installation and integration or migration
  - Maintenance
  - Warranties
  - Operating system and specialized licenses
  - License compliance
  - Upgrades and patches
- Operations
  - Monthly recurring costs
  - Personnel (IT, management)
  - Training
  - Backup and recovery processes
  - Security (breaches, recovery and prevention)
  - Downtime

  - Electricity (equipment, cooling, backup)
  - Infrastructure
- Long-term
  - Replacement
  - Future upgrade or scalability

Step 2: Determine the Lifetime of the Solution

- What is the life span of the solution?
- What is the expected timeframe the solution will be needed?
- What is the expected inflation rate of costs?

Will the solution last 5 years, 10 years, or 20 years? Is the solution temporary and only needed for 18 months? What is the anticipated inflation rate? Is inflation increasing or decreasing?

Historical inflation data from 1914 to the present may be found at the following website:[15] http://www.inflationdata.com/inflation/inflation_rate/historicalinflation.aspx.

Step 3: Calculate Recurring Costs for Year 1

The recurring costs identified in Step 1 are multiplied by their recurrence to determine the recurring costs for Year 1. Monthly is multiplied by 12, semi-annually is multiplied by 2, and annually is multiplied by 1; see Table 7.

Table 7: Recurring Costs for Year 1 (Example)

	Cost	Recurrence	Calculation	Total for Year 1
Monthly charge	$1,200	Monthly	$1,200 × 12	$14,400
Annual maintenance	$13,200	Annually	$13,200 × 1	$13,200
Interface	$1,000	Monthly	$1,000 × 12	$12,000
Database maintenance	$500	Monthly	$500 × 12	$6,000
Total Recurring Costs:	—	—	—	**$45,600**

Step 4: Calculate Recurring Costs for Remaining Years of Solution

For example, if the life span of the solution is 5 years and a 2-percent inflation rate is anticipated, recurring costs will need to be calculated for Years 2–5 taking into account the inflation rate.

As shown above (Table 7), the costs that recur over the life cycle of the equipment are the monthly charge, annual maintenance, interface, and database maintenance.

[15] Accessed online January 22, 2019.

To calculate a percentage increase of 2 percent (or .02), for example, the annual total of the respective category is multiplied by 1.02 or 102 percent. Both yield the same result.

$14,400 × 1.02 = $14,688

$14,400 × 102% = $14,688

In this example, monthly charges for Year 2 would total $14,688.

The process is repeated for Year 3 using the total for Year 2 as the starting point, as Year 3 would see an anticipated 2 percent inflation rate over Year 2.

$14,688 × 1.02 = $14,982

$14,688 × 102% = $14,982

Years 4 and 5 are calculated in the same manner. This process is repeated for each recurring charge. If the solution has a longer life span, the calculations are repeated for each remaining year of the solution. A solution with a longer life span may require upgrades, which would increase costs for the respective year.

Table 8 depicts the recurring costs over 5 years.

Table 8: Recurring Costs for 5 Years (Example)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Monthly charge (annual totals)	$14,400	$14,982	$15,282	$15,588	$15,900	**$76,152**
Annual maintenance	$13,200	$13,464	$13,733	$14,008	$14,288	**$68,693**
Interface (annual totals)	$12,000	$12,240	$12,485	$12,735	$12,990	**$62,450**
Database Maintenance (annual totals)	$6,000	$6,120	$6,242	$6,367	$6,494	**$31,223**
Total Recurring Costs:	—	—	—	—	—	**$238,518**

To calculate a decrease in the inflation rate, the percentage of decrease is subtracted from 1.0 or 100 percent, and that result is multiplied by the annual total. For example, a decrease of ½ percent (or .005) would be .995 or 99.5 percent. Both yield the same result.

$14,400 × .995 = $14,328

$14,400 × 99.5% = $14,328

In this example, monthly charges for Year 2 would total $14,328.

Step 5: Calculate Total Cost of Ownership

The recurring costs are added to the one-time costs to determine total cost of ownership. In this case, the two one-time costs are the initial equipment cost and the non-recurring network expense.

Table 9 depicts the total cost of ownership for a solution with a 5-year life cycle and an anticipated 2 percent inflation rate.

Table 9: Recurring Costs for 5 Years at 2-Percent Inflation (Example)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Initial Equipment Cost	$35,000	$0	$0	$0	$0	**$35,000**
Non-recurring network expense	$600	$0	$0	$0	$0	**$600**
Monthly charge (annual totals)	$14,400	$14,982	$15,282	$15,588	$15,900	**$76,152**
Annual maintenance	$13,200	$13,464	$13,733	$14,008	$14,288	**$68,693**
Interface (annual totals)	$12,000	$12,240	$12,485	$12,735	$12,990	**$62,450**
Database Maintenance (annual totals)	$6,000	$6,120	$6,242	$6,367	$6,494	**$31,223**
Yearly Totals	$81,200	$46,806	$47,742	$48,698	$49,672	
Total Cost of Ownership:	—	—	—	—	—	**$274,118**

As indicated in the table above, the total cost of ownership in this example is more than $270,000. This does not include the costs for any upgrades that may be necessary over the 5 years.

It is important to note that planning should take place for either the upgrade or replacement no later than Year 4. Initial planning for large capital costs should begin as early as Year 2 in a 5-year replacement cycle.

If a comparison is necessary for costs of existing systems versus proposed ones, give consideration to the costs required to maintain the existing system that may not necessarily be required for the one proposed. For example, many applications are now web-based, which alleviates the need for hardware and software purchases.

The steps listed above can also be used to compare costs if multiple solutions are available or offered. This is especially important if initial costs appear similar; recurring costs may vary greatly between solutions over their respective life spans, particularly in terms of licenses.

Determining an entity's ability to sustain technology funded initially through a grant does not need to be overwhelming but does require a comprehensive review of all aspects to ensure no costs are overlooked.

Applying for Collaborative Operating Group Status

"Permit no hour to go by without it due improvement." — Thomas Kempis

References

- IPAWS Toolkit for Alerting Authorities
- FEMA IS-247a - Integrated Public Alert and Warning System (IPAWS)
- FEMA IS-251 – Integrated Public Alert and Warning System for Alerting Authorities
- http://www.fema.gov/how-sign-ipaws

IPAWS is a powerful tool for local alerting authorities to inform the public. IPAWS allows the authority to create a single message and distribute through multiple channels. To request access to IPAWS, the alerting authority needs to follow a few easy steps:

- Select IPAWS–capable software or service
- Apply for a COG MOA with FEMA
- Apply for public alerting permissions
- Complete IPAWS training

For more information on this process, refer to Appendix B: IPAWS Adoption Checklist for Alerting Authorities and Appendix G: IPAWS Toolkit for Alerting Authorities.

Select IPAWS–Compatible Software

Prior to applying for IPAWS authorization, the alerting authority must select compatible software to generate CAP messages. This is the only cost for IPAWS the alerting authority will have. FEMA IPAWS and the distribution channels do not charge a fee to alerting authorities.

It is important to identify the alerting authority's needs and requirements before selecting software. Information on the development of specifications, cost basis, and procurement is in the Procuring Alerting Technologies section. In 2019, the IPAWS Office plans to add specific system functions that the alerting authority will need to ensure is included in the selected system. The alerting authority should monitor these actions closely to assure existing systems and new systems meet the new requirements.

The chosen software must be compatible with IPAWS-OPEN and provide the capabilities that your organization requires. For a list of private-sector developers that have access to

IPAWS-OPEN, please view the list[16] of IPAWS-OPEN developers at https://www.fema.gov/alert-origination-service-providers.

Apply for MOA

Who can sign up for IPAWS?

- Federal agencies
- State government organizations
- Local government or public-safety organizations

A Federal, State, or local alerting authority that applies for authorization to use IPAWS is designated by IPAWS as a Collaborative Operating Group (COG).

The alerting authority should start by visiting the FEMA IPAWS website and viewing a short 5-minute video and review the most current IPAWS Toolkit (online[17] at http://www.fema.gov/integrated-public-alert-warning-system and as Appendix G: IPAWS Toolkit for Alerting Authorities in this guide) before beginning the process of implementing IPAWS in a jurisdiction.

The IPAWS website also has the current application form to use. This application requests information on the agency and contact information on key agency personnel. It is important for the agency to list the system(s) it will use to compose and send alerts to IPAWS. The application has room for more than one system for those that may require multiple systems.

The application should be emailed directly to FEMA at ipaws@fema.dhs.gov. Please indicate "COG Application" in the subject line of the email.

When a local alerting authority submits the application for an MOA, it should notify the State IPAWS coordinator. The State coordinator may also be able to assist in preparation of the application.

Apply for Permissions

The COG coordinator at IPAWS PMO will process the application for an MOA. IPAWS will send several documents for the alerting agency to complete. These forms are required to be completed by the local alerting authority and reviewed and approved by the State.

MOA: The MOA is the actual agreement between IPAWS and the alerting authority. The majority of the information in this document, including Rules of Behavior, comes from the application. The alerting authority should review this information carefully. Some authorities use parts of this document and the Rules of Behavior to train and ensure each authorized user of the system fully understands the operation of IPAWS. In 2019, the

[16] Accessed January 22, 2019.
[17] Accessed January 22, 2019.

IPAWS Office plans to add specific system functions and testing requirements that the alerting authority will need to ensure is included in the selected system. The alerting authority should monitor these actions closely to assure existing systems and new systems meet the new requirements.

Application for IPAWS Public Alerting Authority: The alerting authority completes this document. This form is used to identify the distribution channels the authority would like access to and the specific message incident types.

Distribution channels for alerting are as follows:

- CAPEXCH: alerts from COG to COG
- EAS: alerts to broadcasters
- WEA: alerts to cell phones
- NWEM: alerts to weather radios
    - In addition to signing up for IPAWS, operational NWEM capability requires additional COG–level permissions from NWS
- PUBLIC: alerts to public with Non-EAS PUBLIC alerts
    - PUBLIC alert messages can be retrieved using IPAWS All-Hazards Information Feed
    - PUBLIC alert messages can be retrieved using "getMessageList" method within 24 hours as default retrieval configurable time period value

This application must be signed by the designated State official. After completing this form, it should be forwarded to the State coordinator for approval and then forwarded to IPAWS PMO.

Complete Required Training

Each person who will generate IPAWS messages should have completed the FEMA Independent Study course FEMA IS-247a – "Integrated Public Alert and Warning System (IPAWS)." This course is required after applying for an MOA and permissions, but this course may be helpful prior to the application and selecting a system. This course is available at the following link:[18]
http://training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=IS-247.a

The goal of this course is to provide authorized public safety officials with the following:

- Increased awareness of the benefits of using IPAWS for effective public warnings
- Skills to draft appropriate, effective, and accessible warning messages
- Best practices in the effective use of CAP to reach all members of their communities

[18] Accessed January 22, 2019.

The course takes approximately 2 hours to complete and is a prerequisite for full access to IPAWS-OPEN for the purpose of public alerting. FEMA does not provide training on third-party authoring software. Respective vendors should be contacted for any software support questions.

Copies of course completion certificates for the alerting authority must be sent to the State coordinator and the IPAWS PMO before the authority will be activated. All authorized staff should also have training on the specific equipment and procedures and review and sign a copy of the Rules of Behavior. Records of all training should be developed and maintained. The Training section of this guide has additional information on training and documentation.

COG ID Issued

Once all forms have been completed, signed, and approved by the State, IPAWS will issue the COG identification and digital certificate. The COG will receive several communications from FEMA that include the COG ID, certificate, and passwords. The digital certificate is good for 3 years. The IPAWS PMO will reissue certificates as needed. The certificate should be added to the selected IPAWS system. Coordinating with the vendor or service provider will usually make this easier.

IPAWS will also issue a TEST COG ID and Certificate. If the selected IPAWS system can accept two or more IDs, this test certificate should be added. The test COG allows the authority to send test messages to the IPAWS Test Lab at the Joint Interoperability Test Command (JITC). This will provide the capability to practice and train staff on the system.

If the alerting authority has a backup system, it is a recommendation to have a second system or separate log-in identified as a test system, set up for only the test COG to perform testing and training.

Apply for NWEM Permission

If the alert authority requested permission to send messages to the NOAA weather channel, the alert authority must apply for additional authority from NWS. The NWEM channel provides access to NWS radio. The NOAA website describes the system.

> *HazCollect, the NWS's All-Hazards Emergency Message Collection System, is a comprehensive national solution for the centralized collection and efficient distribution of Non-Weather Emergency Messages (NWEMs). NWEMs created by government officials with public warning authority are distributed through the NWS dissemination infrastructure, NOAA Weather Radio All Hazards, other national systems, and to the nation's Emergency Alert System (EAS).*
>
> *A NWEM is a specialized form of an OASIS Common Alerting Protocol (CAP) alert. The CAP alert is sent to the HazCollect*

service via FEMA's Open Platform for Emergency Networks (IPAWS-OPEN) interoperability infrastructure.[19]

For more information, refer to: https://www.weather.gov/hazcollect/.

As of September 2018, the link to NWEM from IPAWS was not available to local authorities, but work continues. It is in the best interest of local authorities to monitor this process to gain this capability when it becomes available in the future.

To apply for access, an application must be completed; refer to https://www.weather.gov/hazcollect/government for more information.

To complete this application, the authority must have its approved COG ID.

Maintain COG

The certificates associated with the COG has a 3-year life span. Local authorities should maintain their COGs on a regular basis. Key areas to communicate with the IPAWS PMO are as follows:

- Change of sponsor
- Change of technical contact
- Change of alerting tools
- Change of alert types
- New MOUs with other agencies or changes of alerting area

[19] National Weather Service. 2013. "HazCollect." Accessed online January 22, 2019. http://www.nws.noaa.gov/os/hazcollect/

Using IPAWS and Other Alerting Technologies

"Knowledge is of no value unless you put it into practice." — Anton Chekhov

References

- Alert and Notification Plan
- FEMA IS-247a - Integrated Public Alert and Warning System (IPAWS)
- FEMA IS-248 - Integrated Public Alert and Warning System (IPAWS) for the American Public
- Code of Federal Regulations (CFR) 47 Part 11 — EMERGENCY ALERT SYSTEM
- CFR 47 PART 10 — COMMERCIAL MOBILE ALERT SYSTEM
- Common Alerting Protocol. v. 1.1, OASIS Standard CAP-V1. 1. (2005).
- Common Alerting Protocol, v. 1.2 USA Integrated Public Alert and Warning System Profile Version 1.0. (2009).
- National Weather Service, Operations and Services; Public Weather Services, NWSPD 10-5, Non-Weather Emergency Products Specification (Instruction 10-518, July 28, 2010).
- FCC Report and Recommendations, Hawaii Emergency Management Agency, January 13, 2018 False Alert

The use of IPAWS and other alert and notification systems will follow the same preparedness cycle as any other system or process in emergency management (see Figure 12).[20]

- Plan
- Organize and Equip
- Train
- Exercise
- Evaluate and Improve

[20] Federal Emergency Management Agency. 2010. *Developing and maintaining emergency operations plans*: *Comprehensive Preparedness Guide 101*, version 2.0.

Figure 12: Preparedness Cycle

The plan has been developed. The "organize and equip" component of the cycle will require documentation of how to use the systems.

Develop Policies, Procedures, and Guidelines

Overview

To use IPAWS and other alert and notification systems effectively, written documentation should be prepared on the use of these systems. The alerting authority should develop documentation of user actions to provide the critical public alerts and notifications that are needed and expected by the public.

Each governmental agency has different structures, and the name for this documentation will vary between agencies. The terms *standard operating procedures (SOPs)*, *policy*, *guidelines*, and other terms may have additional impacts to the documents. An agency should always review the documentation with the appropriate legal and alerting authorities.

- **Policy**: A policy is generally considered a firm rule that must be followed. A *policy* is defined as "a definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions."[21] Policies may have other specific meanings based on governmental structure. Policies can often only be approved by an elected official in a governmental entity. Policies cover specific situations and can often restrict the actions of staff in an emergency.
- **Procedure**: A procedure is often used to define the steps a person should take in a specific situation. A *procedure* is defined as "a series of actions that are done in a certain way or order: an established or accepted way of doing something."[22] Procedures are generally developed by management as instructions to staff. Procedures list specific actions and may restrict the actions of staff in an emergency.

[21] http://www.merriam-webster.com/dictionary/policy (accessed January 22, 2019)
[22] http://www.merriam-webster.com/dictionary/procedures (accessed January 22, 2019)

- **Guideline:** A guideline is often used to describe a general course of action. A *guideline* is defined as "any guide or indication of a future course of action."[23] Guidelines are generally used to provide direction to a trained person. A guideline can allow a trained person to apply personal knowledge and training to an emergency using the provided guidelines to determine the specific actions needed.

Regardless of the name used for these documents, they need to include information and actions needed to successfully alert and notify the public of emergencies and dangers. These operational documents should cover the following questions:

- Who can send alerts?
- What is the authority?
- How is authority delegated?
- Who can request an alert be issued?
- When can an alert be issued?
- What systems (e.g., EAS, WEA, NWS, IPAWS All-Hazards Feed, ENS, sirens, other systems) should be used?
- How are the systems operated?
- What segment of the populations does each system reach?
- Can multiple systems be used simultaneously to reach more people?
- What follow up from an alert is needed?
- What is the typical public reaction (call 9-1-1, ignore, etc.)?
- What is the desired public reaction?
- Who needs to be notified before or after alerts (e.g., 9-1-1, Public Information Officer [PIO], alert authority, other COGs, State, tribe)?
- How often and when is the alert re-sent?
- How should a false or incorrect alert be handled?
- How are the systems used for exercises and pre-planned events?
- Does your alerting tool support IPAWS in a live environment as well as support a test environment with the IPAWS Lab?

Documentation Process

The process to develop operational documentation follows a simple order similar to the emergency management preparedness cycle.

1. Develop
2. Publish
3. Use

[23] http://dictionary.reference.com/browse/guideline (accessed January 22, 2019)

4. Review and Update

Develop

The first step to developing operational documents is to identify a team to work on the documentation. This team should consist of the staff that operates these systems, management, local broadcasters, and even the public in some cases. Consider a member of the public in jurisdictions that may have unique audiences such as people with disabilities and others with access and functional needs or those with cultural differences.

The next step is research. Time should be spent researching the information needed to effectively alert the public. A partial list of documents to review is as follows:

- Local alert plan
- Local emergency operations plan
- State alert plans
- State EAS plans
- FEMA IPAWS Rules of Behavior
- FCC Rules (47 CFR 10 and 47 CFR 11)
- FCC CSRIC IV best practices for alerting and security
- Vendor-provided instructions and training
- Lessons learned from previous events and exercises

The team should ask two questions: **What documents are needed? In what format should these documents be produced?**

The team will determine what documentation is needed based on research. This can be an assortment of different documents, such as a policy on who can send alerts, a job aid, or a checklist for the system operator. The team will then outline the various documents and assign an editor and/or writer to each document or sections. Team members then develop and share the document drafts. Sharing of document drafts among team members will help ensure the documents complement each other and do not conflict. The team should develop an internal review process to ensure that documents are developed into a comprehensive guide.

Draft documents should be reviewed; some of the people to consider using to review drafts are as follows:

- **System users**: System users can review text to see if the language is easy to follow. The best reviewers are a combination of those with limited or no knowledge of the system and ones with good knowledge of the system. This allows for both perspectives.
- **PIO**: The PIO can review text to assure that the use of the system(s) is in line with the public information needs of the community.

- **Alert authority**: The alert authority should review the documents and possibly provide approval. This is best when the authority is delegated.
- **Legal representative**: The jurisdiction's legal counsel should review the documents to provide protection for the jurisdiction.

Publish

It is recommended that documents be published in two steps: **Draft** (for exercise use only) and **Final** (for pilot testing, etc.). The terms used to refer to these are less important than the process. A first-reviewed document is placed into limited use, for an exercise or a special event, for example. This may follow the Homeland Security Exercise and Evaluation Program (HSEEP) process and start with a tabletop exercise and build from there, followed by review and updates as needed. This process will make the final document better.

The final approved document should be published. This document should be made available to all stakeholders involved in its creation. Most importantly, it needs to be published to the users and then incorporated into user training.

Use

The first most important part of the use of any technology and process is training. The technology and operational documents should be used to train all users to ensure they understand their roles, responsibilities, and actions required to perform their functions. Many agencies have initial training and then move on to the next issue. Training is improved when it is ongoing and includes refresher sessions. It is best when the system and process are integrated into daily or regular activities. (Refer the Training section of this guide for more information.)

One of the best ways to maintain skills is to integrate actions into regular work flows. Public alerting may not lend itself to daily use but would fit into an agency's regular exercise schedule. IPAWS and other alerting tools may be used in exercises and more routine public notifications. IPAWS has been used for boil-water notices, notifications to stay off roads during winter storms, 9-1-1 outages, and disregarding accidental siren activations. Appendix H:Model Alert and Notification Plan and the Pre-planned Events section of this guide contain information on the use of IPAWS for pre-planned events. The Exercise section contains additional information on the use of alerting systems. Any use should meet applicable laws and State and jurisdiction alerting plans.

An agency should also have a formal feedback process in place to elicit comments and suggestions for changes, modifications, and improvements to technology and processes. This feedback is used to review and update the documents.

Review and Update

Each procedure, plan, and technology should be reviewed and updated as risks and situations change. Feedback from users, incidents, exercises, and vendors allows these documents to be improved over time. After each major exercise or incident, the response

should be reviewed for lessons learned and places to improve. At a minimum, all policies, procedures, guidelines, plans, and systems should be reviewed annually.

One method to accomplish this is to segment systems in use into four or six groups. Each group can be reviewed quarterly or bimonthly, making the process manageable. Documents should include a history table noting when it was published, last updated, and last reviewed.

Documentation Content

Each document should contain basic information and be structured to align with an agency's existing format. One format example is provided below.

Header: This contains the authority, title, effective date, revision number, and revision date.

Purpose: The purpose describes the need for the guideline and a summary of the guideline's intent.

Scope: The scope describes to whom and when the guideline applies.

Guideline: The guideline itself describes the steps to take or the reasons for or options for actions allowed.

Example guidelines are included in Appendix J: Model Procedures.

Training

All systems and procedures should be reinforced with training. *Training* is defined as "a process by which someone is taught the skills that are needed for an art, profession, or job"[24] or "to give the discipline and instruction, drill, practice, etc., designed to impart proficiency or efficiency."[25] To use and perform the critical functions of alerting the public effectively, all users must understand the systems and procedures. This is accomplished with two types of training: initial and recurring.

Initial training consists of training from the vendor on basic and advanced operation of the system and operational procedures. This training is provided to all staff and users when a new system is deployed and for each new employee during new-hire training.

Recurring training is provided periodically to refresh users' skills and knowledge. The use of the systems will determine how often this training is needed. All skills are perishable, which is why skills such as using a telecommunications device for the deaf (TDD) are practiced regularly. The more a skill is used, the longer that skill is maintained. All IPAWS training should include the use of the IPAWS Lab at JITC to

[24] http://www.merriam-webster.com/dictionary/training (accessed January 22, 2019)
[25] http://dictionary.reference.com/browse/training (accessed January 22, 2019)

provide feedback to the users. (Refer to the IPAWS Message Viewer section of this guide for more information.)

For IPAWS or any alert and notification system, users should have training on the following:

- Use of technology
- Agency procedures for alerting
- Agency post-alert procedures
- Creating and formatting messages
- Security procedures for the technology

All training should be conducted in methods that correspond with the ways people learn, which has been discussed over the years. Traditionally three types of learning styles are used to reinforce skill development:

- Seeing; i.e., a visualizing style
- Hearing; i.e., an auditory style
- Doing; i.e., a tactile (kinesthetic) style

Another model delineates seven learning styles, which are described as follows:

- Visual (spatial); i.e., a preference for using pictures, images, and spatial understanding
- Aural (auditory-musical); i.e., a preference for using sound and music
- Verbal (linguistic); i.e., a preference for using words, both in speech and writing
- Physical (kinesthetic); i.e., a preference for using your body, hands and sense of touch
- Logical (mathematical); i.e., a preference for using logic, reasoning and systems
- Social (interpersonal); i.e., a preference for learning in groups or with other people
- Solitary (intrapersonal); i.e., a preference for working alone and using self-study[26]

A good resource for training is FEMA's Independent Study Program IS-265: Basic Instructional Skills from the Emergency Management Institute (EMI) at http://training.fema.gov/. This course provides a basic understanding of the instructional and learning process.

An important component of any training is recordkeeping. Training records should include the trainer, the curriculum, and attendees. Results of tests, quizzes, or performance are also good to maintain in the training record. Local legal staff should be

[26] learning-styles-online.com. 2015. "Overview of learning styles." Accessed online January 23, 2019. http://www.learning-styles-online.com/overview/

consulted to determine what level of information, open records impacts, and record retention issues may exist for your agency.

Exercise and Regular Use

CSEPP conducted a series of tests using participating counties' alert authoring tools and the IPAWS Lab at JITC. Some of the lessons learned that should be kept in mind as these tools are used are provided below.

- The tools used to author IPAWS messages should be selected based on the needs of a respective agency.
- All IPAWS tools should include simple ways to cancel or update messages.
- The public should be educated on IPAWS and the messages that can be sent.
- Not all cellular phones will display the same message the same way.
- Not all display systems and text-to-speech display messages the same way.
- Some text-to-speech will read "#" as "pound sign"; others will read it as "hashtag."
- Display systems do not recognize bullet points.
- Other characters used can change a message.
- Each authoring tool operates differently and can implement similar features differently.
- A user's ability to practice and test authoring tools will benefit deployment and operationalization of these systems.
- The more comfortable and confident users are with the systems, the more likely the systems will be used.
- All authoring tools should have complete and easy-to-understand user manuals and job aids.
- All authoring tool vendors should conduct hands-on user training (in person or webinar).
- More user interaction is needed with the vendors to ensure better tools.

Understanding the advantage and disadvantage of each type of testing and developing clearly set objectives and measures for testing and the type of testing should be done.

What are the advantages and disadvantages of conducting IPAWS exercises?

- Simulated: how it is currently handled, with the operator pretending to send alerts
- Lab: delivering exercise messages to the JITC
- Live: delivering exercise messages to the public

Table 10 lists advantages and disadvantages of these three modes of conducting an IPAWS exercise.

Table 10: Advantages and Disadvantages of IPAWS Exercise Types

	Advantages	Disadvantages
Simulated	▪ Easy ▪ Good way to practice the sequences involved in each step ▪ Get used to sequences without risk ▪ Comfortable ▪ Controlled environment ▪ Time to think ▪ Idea sharing/process improvement ▪ Catch mistakes ▪ No calls to complain ▪ Opportunity to review procedures ▪ Time to create templates for different environments ▪ Know where resources/job aids are ▪ Ability to define roles and responsibilities	▪ Does not reflect what it really takes ▪ Not really testing the systems ▪ Relaxed comfortable environment ▪ No feedback from the public ▪ Not gaining confidence in the systems ▪ Not getting fair evaluation ▪ Unrealistic portrayal of time and other resources required in a live scenario ▪ Not truly indicative of all the intangibles present in a live environment
Lab	▪ Allows for testing of functional and aesthetic aspects of message creation and dissemination, except distribution and end user ▪ Instant feedback from the IPAWS Viewer tool ▪ Ability to troubleshoot technical issues immediately ▪ Safe; it is okay to run into problems or make mistakes as it is a closed system ▪ Gaining confidence in "technical" aspects ▪ Hands-on aspect can help conquer the fear of alert originator personnel using the system ▪ Can coordinate with JITC for real-time communication to complement IPAWS Viewer ▪ Able to correct issues with messages and procedures ▪ Find process gaps ▪ Ability to pre-test messages ▪ Test as much as you want ▪ Technical expertise available (scheduled) ▪ Free ▪ No one to judge you (i.e., impartial) ▪ Higher knowledge of vendors' software and graphical user interface (GUI); one-on-one training with vendors is	▪ Infrastructural aspects of distribution (cell tower location, how do users respond) are not able to be measured ▪ Time that text-to-speech conversion takes is unable to be measured ▪ No end-user feedback from the public

	Advantages	Disadvantages
	available to increase skills and understanding ▪ Allows for better training ▪ Try new things; be creative ▪ Helps the fear go away	
Live	▪ Replicates actual usage ▪ Allows end-to-end testing ▪ Increases public awareness as to what an actual situation will entail ▪ Receive public feedback on messages ▪ Metrics; know how much of community is notified ▪ Identifies weaknesses in systems (configurations) ▪ Validates assumptions (cell tower coverage; measuring the residual deviations to cell tower reach) ▪ Timing can be accurately measured	▪ If message not prepared correctly, public feedback could result in distrust of the brand ▪ Complaints; those not aware that the test was planned ▪ Takes much more planning ▪ More difficult and expensive ▪ Public reaction ▪ Introduces a level of politics; correct personnel need to be briefed and public relations must be honed ▪ Requires active and robust public relations activities

If an exercise program was developed or IPAWS was integrated into the regular exercise program, what would the objectives of the inclusion be? How would the objective be measured? Table 11 lists objectives and measures for each type of IPAWS exercise.

Table 11: Objectives and Measures of IPAWS Exercise Types

	Objectives	Measures
Simulated	▪ How well does a user operate the system(s)? ▪ Use COG-to-COG? ▪ Help to develop decision-making skills of the users ▪ Test procedures	▪ Observation
Lab	▪ How well does a user operate the system(s)? ▪ How long does it take to send a message? ▪ How is a message updated/canceled? ▪ Time of message, correct format ▪ What happens with multiple messages? ▪ Does IPAWS meet the time requirements of CSEPP? ▪ Can messages be sent COG-to-COG, and get action? ▪ Help to develop decision-making skills of the users	▪ Observation ▪ IPAWS Viewer ▪ System Logs

	Objectives	Measures
Live	▪ Is the message understood by the receiver? ▪ Are there any differences between carriers? ▪ What is the time to deliver to user? ▪ What happens with multiple messages? ▪ Do broadcasters have their equipment properly configured?	▪ Observation ▪ Field Sampling ▪ IPAWS Non-Weather Blog ▪ System Logs (local and broadcasters) ▪ Public Reaction ▪ Public prize to people who follow

A blank worksheet is located in Appendix K: IPAWS Exercise Worksheet.

The IPAWS JITC Lab is a good resource to use for testing and exercises. The IPAWS Viewer will store tests for about 24 to 48 hours after testing and is best used with the Firefox browser. Details on what is available from the JITC Lab are located in Appendix L: Testing with IPAWS Lab.

To use alert and notification tools effectively, skills learned must be kept current. A skill not used is often forgotten. These skills can be used in regular operations, exercises, and pre-planned events. Beginning in 2019, alerting authorities may be required to conduct periodic testing with the IPAWS Lab to maintain their COG status. This should be included in testing and training plans.

Regular Operations

Integrating alert and notification systems into regular operations can take some outside-the-box thinking. The benefits of integrating these systems are that doing so builds familiarity with systems, enables better thinking skills, and provides better response to emergencies. Use should include operation of the technology, forming messages, and determining distribution channels. These activities will build skills. A variety of events can assure more use of the systems.

The first opportunity is during normal testing. Many systems require a weekly test. While not all distribution channels allow this, some do. By using IPAWS to send these required tests, users will gain experience with systems and distribution channels that allow tests to be used. These tests should be conducted at different times of the day and days of the week to allow multiple users to practice. Some systems allow users to set the tests to run automatically with little or no user intervention. When done in this manner, a great practice opportunity is lost.

Many agencies work with other governmental agencies such as highway, roads, water, sewer, or parking agencies. These relationships can be harnessed to provide users with additional messages to develop, the opportunity to select the appropriate distribution method, and use of the equipment to send alerts and notifications to the public.

Depending on the technology in use, other opportunities to use the system(s) may exist. If the system(s) allows call groups, it might be used for special unit call outs,

announcements, overtime notifications, etc. Each agency will have its unique cases where alert and notification systems can be used within the rules, even for pre-planned events as described below.

Pre-planned Events

One way to exercise IPAWS in the organization is to use it for appropriate pre-planned events, such as drills, planned power outages, fairs, and races. This is allowable under the rules if the authority determines it is appropriate. During the planning of a pre-planned event (i.e., an exercise or public event), the risks associated with the event should be identified. If the planned event has a potential risk to the public or public safety, the use of IPAWS to mitigate that risk may be appropriate. Appendix H: Model Alert and Notification Plan has an appendix for the use of IPAWS for pre-planned events.

Examples of events and risks are provided below.

- Event: Controlled burn of large area
  - Risks: Smoke on roadway impairing driving; aggravating medical conditions of people in area
- Event: school active-shooter exercise
  - Risks: Panic of the general public in the area; Good Samaritans' reaction and putting exercise players at risk
- Event: Major bicycle road race
  - Risks: Traffic accidents; injury to riders and bystanders

IPAWS has several dissemination media (Table 12), and each system has a different audience and rules for use.

Table 12: IPAWS Dissemination Methods

Dissemination System	Audience	Rules	Notes
Emergency Alerting System (EAS)	Broadcast radio and television viewers (not Internet or satellite)	47 CFR 11 State EAS Plan	Broadcasters are not required to re-transmit alerts from local authorities. An EAS alert will be delivered to a large audience.
Wireless Emergency Alerts (WEA)	Wireless phones in the area of the alert	47 CFR 10	WEA has specific criteria for use. See * below.
Non-Weather Emergency Messages (NWEM)[27]	Weather radio users	NWS policies	NWEM alerts will be sent to a National Weather Service (NWS) transmitter that covers a large area. The alert may also be rebroadcast

[27] As of September 2018, the link to NWEM from IPAWS was not available to local authorities, but work continues. It is in the best interest of the local authorities to monitor this process to gain this capability when it becomes available in the future.

Dissemination System	Audience	Rules	Notes
			by broadcast radio and television as an EAS message, but the entities are not required to carry.
IPAWS All Hazards Information Feed	Third-party software and service providers; usually a subscription type service	IPAWS rules	Currently, defining specific criteria for delivery due to the many varied systems using this data is unclear.
Collaborative Operating Group (COG) to COG	Other specific COGs	IPAWS rules	Used to coordinate and share information between COGs.

* For an alert to be sent to the WEA system, the event must meet the following criteria in accordance with 47 CFR 10.400:

> *(1) Urgency. The CAP Urgency element must be either Immediate (i.e., responsive action should be taken immediately) or Expected (i.e., responsive action should be taken soon, within the next hour).*
>
> *(2) Severity. The CAP Severity element must be either Extreme (i.e., an extraordinary threat to life or property) or Severe (i.e., a significant threat to life or property).*
>
> *(3) Certainty. The CAP Certainty element must be either Observed (i.e., determined to have occurred or to be ongoing) or Likely (i.e., has a probability of greater than 50 percent).*

When determining the event code to use, the following definitions of some common codes from the NWS Instruction 10-518 *Non-Weather Emergency Products Specifications* are provided to assist in compiling the alert message.

> ***Civil Danger Warning (CDW).*** *A warning of an event that presents a danger to a significant civilian population. The CDW, which usually warns of a specific hazard and gives specific protective action, has a higher priority than the Local Area Emergency (LAE). Examples include contaminated water supply and imminent or imminent or in-progress military or terrorist attack. Public protective actions could include evacuation, shelter in place, or other actions (such as boiling contaminated water or seeking medical treatment).*
>
> ***Civil Emergency Message (CEM).*** *An emergency message regarding an in-progress or imminent significant threat(s) to public safety and/or property. The CEM is a higher priority message than the Local Area Emergency (LAE), but the hazard is less specific than the Civil Danger Warning (CDW).*

> ***Local Area Emergency (LAE).*** *An emergency message that defines an event that, by itself, does not pose a significant threat to public safety and/or property. However, the event could escalate, contribute to other more serious events, or disrupt critical public safety services. Instructions, other than public protective actions, may be provided by authorized officials. Examples include a disruption in water, electric or natural gas service, or a potential terrorist threat where the public is asked to remain alert.*
>
> ***Law Enforcement Warning (LEW).*** *A warning of a bomb explosion, riot, or other criminal event (e.g., a jailbreak). An authorized law enforcement agency may blockade roads, waterways, or facilities, evacuate or deny access to affected areas, and arrest violators or suspicious persons.* [28]

When using IPAWS for a pre-planned event, the alerting authority has the ability to write alert messages in advance to properly communicate the message. Engaging PIOs to develop message templates, various expected messages, and a communications plan will benefit the event. Appendix N: Model Public Affairs Communications Plan is an example.

Helpful hints for the use of IPAWS for pre-planned events are provided below:

- Each audience, message, and distribution media should be reviewed.
  - Is the audience smaller than the distribution media will reach?
  - Will the message cause more concern to the public than the event?
- It is not recommended that the authority use WEA messages unless it can include and edit the free-form 90 character <CMAMText> element into the CAP message.
- The WEA message will also allow the alerting authority to make effective use of the <expires> element to keep alerts active for the time of the event. WEA messages, unlike EAS, will be broadcast to phones as they enter the selected area of the alert until the <expire> time.
- EAS alerts will be distributed to the broadcast audience, which is often larger than the intended audience. For an event that is small and limited to a specific area, EAS may not be the best distribution media. Understanding how your local broadcast stations are configured is important in selecting the proper distribution media.

Exercise

As discussed above, pre-planned exercises provide an excellent opportunity to use alert and notification systems. A major exercise may affect the public and require an alert on its own. A hostile-action exercise may provoke fear or even action by the uninformed

[28] National Weather Service, Operations and Services; Public Weather Services, NWSPD 10-5, *Non-Weather Emergency Products Specification* (Instruction 10-518, July 28, 2010)

public that would put them or the exercise participants in danger. For these types of events, a live message may be appropriate.

Exercises can also benefit from the use of simulated alerts. IPAWS provides alerting authorities with access to a test COG for the use of training and exercises. This test COG can be programmed into many IPAWS authoring tools as a separate distribution environment.

The test COG, when properly implemented, directs the authoring tool to a different IPAWS-OPEN environment. This is the IPAWS-OPEN Test Development Lab (TDL) located at the IPAWS Lab at JITC. This will allow users to create and send messages to a test environment without alerting the public.

When using the test environment, users should ensure the following to prevent errant alerts:

- Ensure authoring tool is pointed to the test lab environment.
- Ensure the authoring tool is not pointed to any other environment.
- Ensure other systems, such as alert bells, lights, and email, are disconnected.
- Disconnect the system if it is connected to a radio transmitter.
- Start the testing by sending a Required Weekly Test (RWT) to ensure it is connected to the correct location.
- Use a two-person team—one person to create the message and one person to verify prior to sending.
- Notify alerting authority, 9-1-1, and response agencies that testing is being conducted.
- Use the IPAWS Message Viewer to monitor the results.

IPAWS Message Viewer

The FEMA IPAWS Program Management Office (PMO) has developed an IPAWS Message Viewer. Authorized alerting authorities can use this service to practice writing and sending IPAWS messages in a closed testing environment at the IPAWS Lab. The IPAWS Viewer will store tests for about 24 to 48 hours after testing and is best used with the Firefox browser. To use the IPAWS Message Viewer, the alerting authority must have the following:

- IPAWS-compatible alerting tool (a list of developers can be found at www.fema.gov/how-sign-ipaws)
- MOA with FEMA for Production or Test access
- A training COG identification (ID) and certificate (note: this is not the Production certificate and usually starts with a “15”)

The alerting authority must verify that the authoring tool is connected to the IPAWS Lab at JITC and not connected to the IPAWS Production system.

Instructions on the use of the IPAWS Viewer are in Appendix M: IPAWS Message Viewer.

Message Template Development

To begin creating message templates, the public alerting plan should be used to identify the types of risks to an agency. With the risks identified, templates with generic messages can be developed to help users send a message more quickly. Care must be used with templates as they rarely cover all situations, and users must be able to edit the template and remove unrelated information as needed. A public message will have an adverse effect if inappropriate information is in a message and confuses the public.

A best practice for effective message development is to engage the following resources (Figure 13):

- Operations personnel: These people understand what the desired end results should be to accomplish their plans.
- Technical personnel: These people understand the capabilities and limitations of the systems used.
- Public affairs personnel: These people understand the format and content of messages.

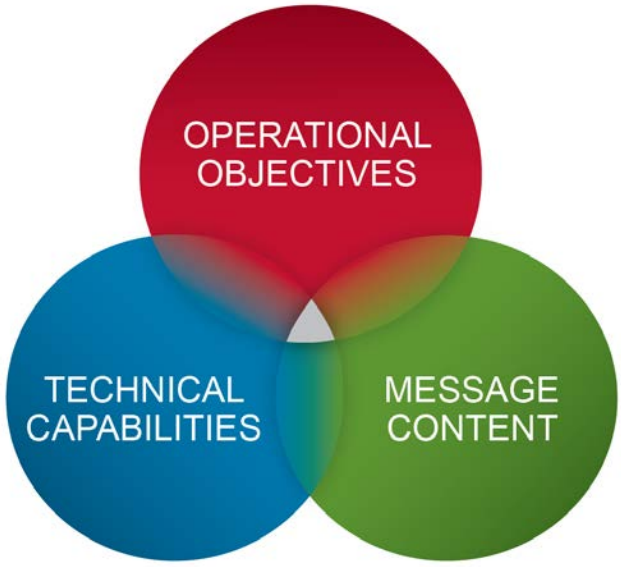

Figure 13: Three Aspects of Effective Message Development

A CAP message has many components, but the primary fields seen by the public are shown in Table 13. This table was developed to assist the CSEPP Messaging Work Group in developing predefined messages for use with IPAWS. These messages are intended to be formatted to allow acceptance by the four dissemination systems (EAS, CMAS, NWEM, and the all-hazards information feed).

For each message, templates should be developed that contain at a minimum the CAP elements identified below.

Table 13: CAP Message Elements

Element Name	Element Used by NWEM	Element Used by EAS	Element Used by WEA	Notes and Descriptions
eventCode	X	X	X	Messages intended for EAS, WEA, and HazCollect dissemination must include one and only one instance of this with a value using a same-standard three-letter value.
headline	X			The text headline of the alert message. 160 characters including spaces for NWEM.
description	X	X		The text describing the subject event of the alert message. Messages should have meaningful values for the <description>. The content in <description> may be truncated and it is therefore recommended that essential information be addressed first. The combination of <description> and <instruction> is <= 160 words for NWEM. <description> is 1,800 characters for EAS.
instruction	X	X		The text describing the recommended action to be taken by recipients of the alert message. Messages should have meaningful values for the <description>. The content in <description> may be truncated and therefore it is recommended that essential information be addressed first. The combination of <description> and <instruction> is <= 160 words for NWEM and 1,800 characters for EAS.
Parameter CMAMtext			X	This is the WEA message displayed to the public. Message containing free form text limited in length to 90 English characters, but no website or telephone number links.

The U.S. Department of Homeland Security (DHS) Science and Technology Directorate (S&T) *Report on Alerting Tactics* contains helpful information on alerting. Appendix D of that report has helpful information on formatting messages, as shown on the following page.

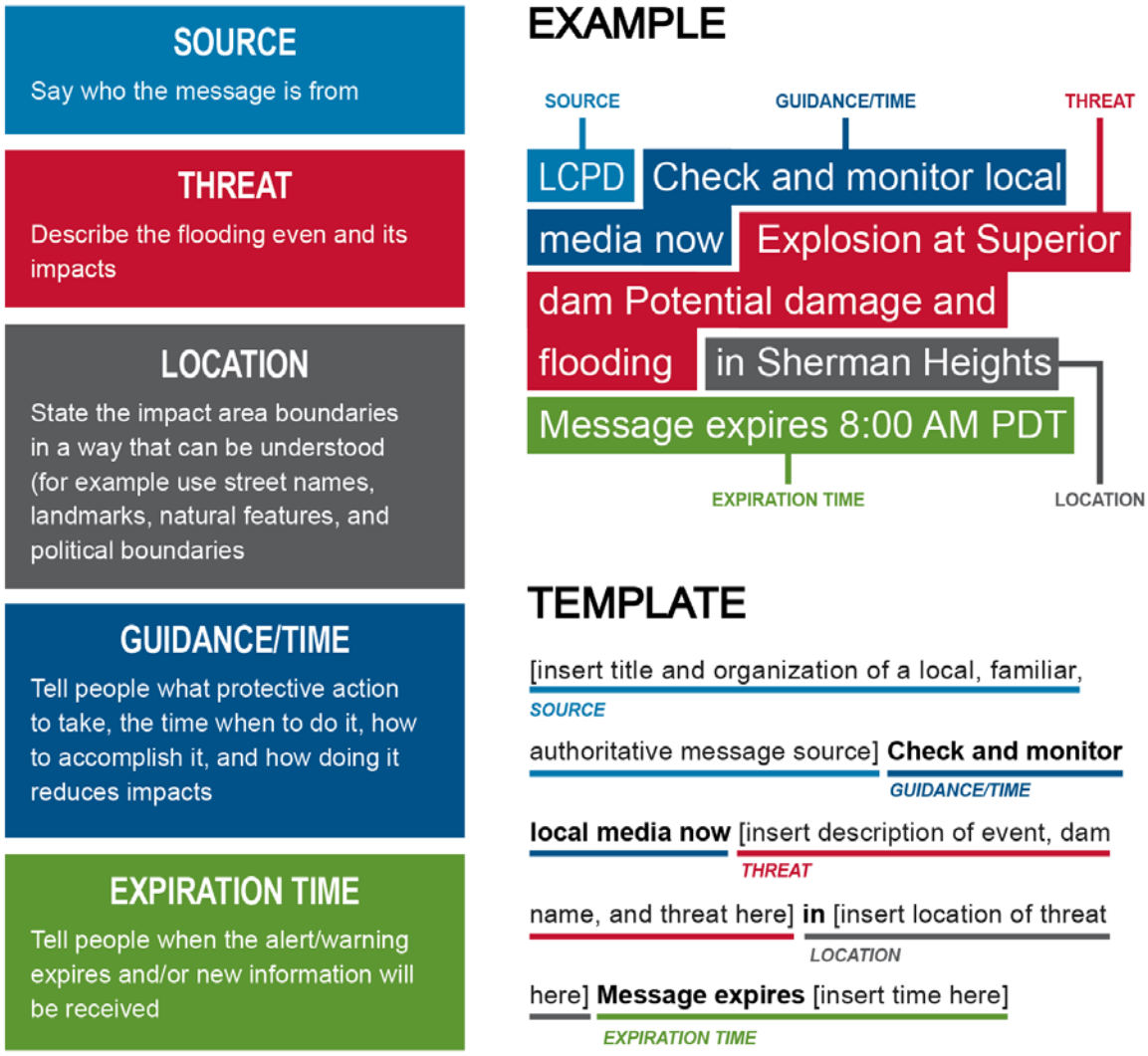

Figure 14: Effective Message Formatting

Lessons Learned

Creation of messages and message templates must follow the guidelines of the distribution system used. During CSEPP IPAWS testing, several discoveries were made on how to best use these tools:

General

- **Applications taking the time from the local device, not a network source—**This can result in message failures due to the times of the CAP message being outside the allowable parameters of IPAWS-OPEN. Ensure the device time is correct.
- **Incorrect or not changed default settings—**Several systems allow for the user to set default settings. This includes default end dates, durations, and text from previous messages. If these are not checked and changed as needed for an agency, messages

may not have the intended meaning to the public. Use a two-person verification process.

- **Keeping the text from the previous message—**The system can keep the text from the previous message or pre-populate a message. Users must carefully review each element. This can result in duplicate or incorrect messages. Use a two-person verification process.
- **Text cut and paste—**Cutting and pasting text into IPAWS applications resulted in formatting issues in some word-processing programs that may affect the text in the message or prevent the message from being accepted or sent. Using a text editor to remove special formatting and characters works in some cases, but caution should be used, as some web browsers may add formatting to the text that is not visible to the user. Do not cut and paste to create messages.
- **Multiple pages for each message—**Some authoring tools are set to generate a message for only one distribution channel at a time. To send a message to all channels, a message for each channel must be created by the user. This adds time to the alerting process and increases the potential for error among the messages. Develop specifications carefully when selecting a tool. (Refer to the Procuring Alerting Technologies section of this guide.)

EAS

The display of an EAS message depends on the equipment at the broadcaster's location. The way a broadcaster sets up its system will have an impact on the way a message is displayed to the public and, in some cases, if it is displayed at all. Two examples of systems to display alerts on televisions are full screen or text crawl. An agency should understand how messages will be displayed before creating messages and templates. (Refer to the Commercial Broadcaster Capabilities section of this guide.)

- Full-screen display (Figure 15) is often used by cable broadcasters to display an alert. The message is displayed for a period of time. If the message is long, it is divided across several pages and displayed.

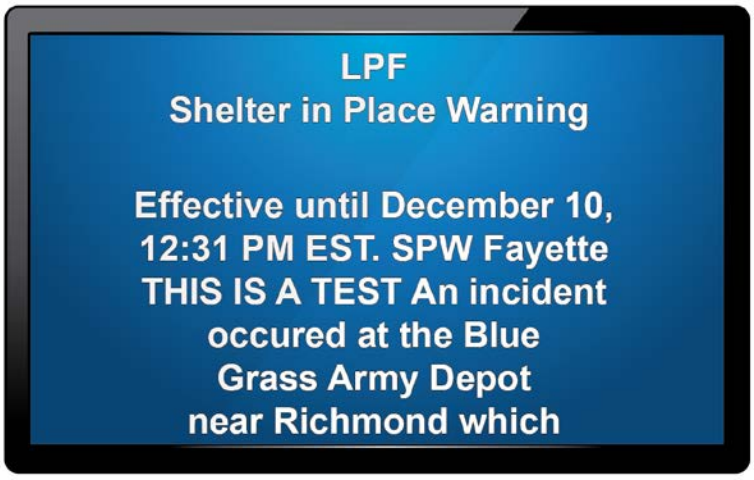

Figure 15: Full-screen Display Example

- The text-scroll method involves scrolling text on a regular screen or on a colored banner. In Figure 16, the text is scrolling over video and is difficult to read.

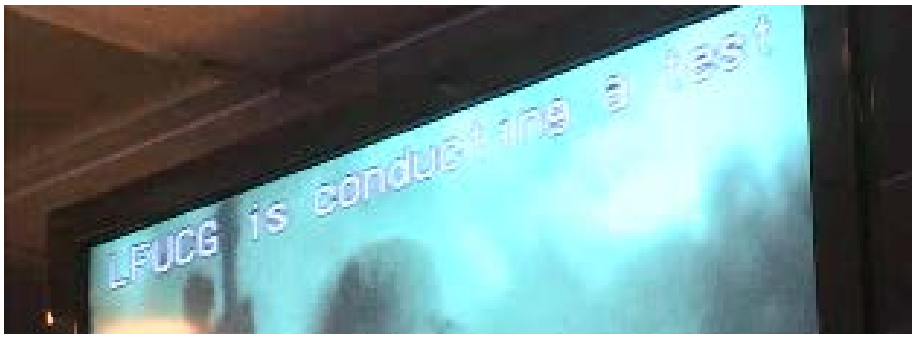

Figure 16: Text-scroll Display Example

For an EAS message, the system will add a header to the scripted message. The following is an example of an EAS header after the CAP to EAS conversion in the displayed message:

```
ZCZC-CIV-FRW-008101+0129-3501901-LLLLLLLL-
Message from CO Pueblo County Sheriff's Office,Pueblo,CO.
```

This header is displayed by the EAS distribution point as something like this:

> *Civil authorities have issued a Fire Warning for the following Colorado counties: Pueblo. Effective until December 17, 3:31 PM EST.*

After the header, the text from the description and instruction may be added. The time listed in the header comes from the sent time and duration or expire time. This may not

be the same as the time listed in the text of the message, which may lead to confusion by the public.

This header is added to the text message and can extend a message to be longer then intended when it is created. When the message becomes too long, the system will simply end the message at the limit defined by the broadcaster. Decoder text crawls can be set to loop several times or for message length, which often ends at 2 minutes. This can result in the loss of some of the message. The message shown in Figure 17 ended on the word "to" after 2 minutes the first time it was displayed and faded out and ended at the end of the word "this" after 2 minutes the second time it was displayed. An agency should understand how messages will be displayed before creating messages and templates. (Refer to the Commercial Broadcaster Capabilities section of this guide.)

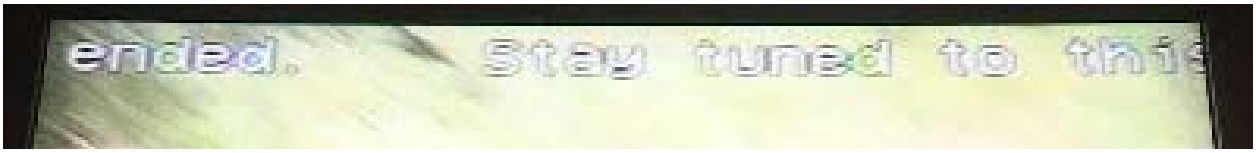

Figure 17: Shortened Message Example

The distribution systems use text-to-speech for the audio from CAP messages unless an audio file is attached to the message. This will have an impact on the way certain words are pronounced. This may affect the message, but testing also found that the use of characters also had an impact on the message (Figure 18.

Figure 18: Special Characters in CAP Messages May Cause Confusion

A text-to-speech reader may translate the hyphen in Figure 18 as either "dash" or "to" and ">" as "greater than" in the message audio. This could lead to public confusion. Not all systems translate these characters the same way. An example is the use of the symbol "#" which can be translated as "hashtag" by one system and "pound sign" by another.

Some messages may use carriage returns to go to the next line and divide the message to be more readable. Some origination systems used spaces for the carriage return, but one

origination system simply ignored the carriage return. This causes text to run together and affect meaning. The screen shot in Figure 19 shows an example where the fact that the impact includes “Southeast 2” may be lost to the viewer.

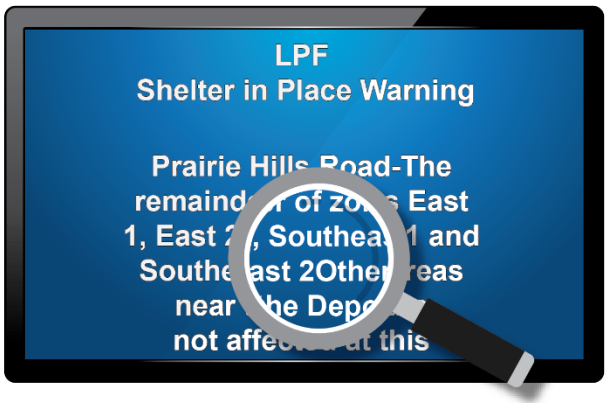

Figure 19: A Carriage Returns May Cause Messages to Incorrectly Display

The CAP message also will allow an operator to include a picture, audio, or video. These are called a <resource> element in CAP. If there is one present, it may replace the Description and Instruction in the displayed message to the public, but most currently deployed EAS devices do not support video or pictures, only audio. The Authoring tools each handle these elements differently. Some tools will allow you to record on the fly; others need another device to record the message. Some tools will allow you to upload the file to their system, while others require you to place the message in the agencies’ publicly available website then add a link into the CAP message. This is a powerful tool, but some planning is required.

WEA

WEA messages are limited in the size of the message. Agencies must plan the best way to use this distribution channel. Most systems allow users to use the 90-character free-form text element of a CAP message called <CMAMtext>; this expands to 360 characters in May 2019.

If the <CMAMtext> is not present, the wireless provider will use the following CAP elements to create the message:

- “What is Happening”—based on CAP Alert <eventCode> element
- “When the Alert Expires”—based on CAP Alert <expires> element
- “What Action Should be Taken”—based on <eventCode> for two special cases and <responseType> elements for other allowed CMAS event codes
- “Who is Sending the Alert”—based on CAP Alert <senderName> element

WEA messages are displayed on phones differently depending on the software of the phone. Figure 20 shows two phones with the same message. On one phone, the

<CMAMtext> CAP element was followed by a message that was a combination of the <Urgency> and <Severity> CAP elements.

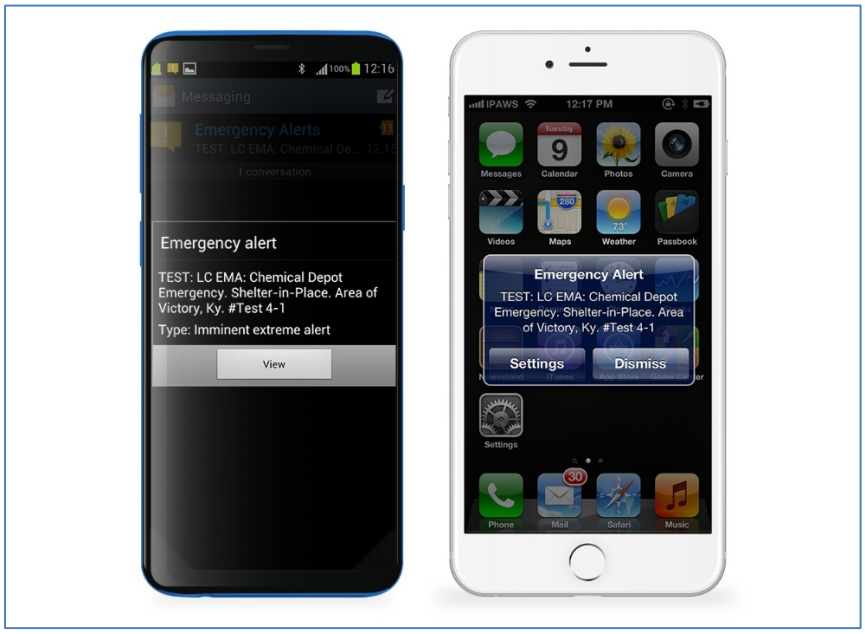

Figure 20: An Alert Displayed Differently on Different Phones

The phones can also store previous messages received (Figure 21).

Figure 21: Multiple Alerts Display

It is important to understand how the text that will be displayed and the importance of the 90-character limit. There is a helpful document on the creation of WEA messages. The

DHS Science and Technology Directorate contracted research by the National Consortium for the Study of Terrorism and Responses to Terrorism (START) at the University of Maryland. The study, *Comprehensive Testing of Imminent Threat Public Messages for Mobile Devices*, provides some useful suggestions. The project that created this document was described as follows:

> *This project sought to determine the optimized message contents of imminent threat wireless emergency alert (WEA) messages delivered over mobile communication devices. This report presents findings for the first WEA messages disseminated about imminent threats (i.e., first alert messages) from two research phases with U.S. adults: (1) eight experiments, seven focus groups and 50 think-out-loud interviews; and (2) a survey of an actual "real world" severe flood in Boulder, Colorado. It also integrates findings from across study methods and provides actionable guidance and considerations for optimized message contents of imminent one-hour-to-impact threat alerts delivered over mobile communication devices.*

This document is available at the Homeland Security Digital Library (HSDL),[29] which is sponsored by the DHS National Preparedness Directorate, FEMA, and the Naval Postgraduate School Center for Homeland Defense and Security.

One of the major recommendations from this study is the order of information in a WEA message, which is as follows: the source of the alert, guidance, hazard, location, and time. WEA message size limits can lead to confusion. The study discussed the issue of a message that was not clear to the receiver and found that messages without clear direction as to the action to take and to whom the message applied may be ignored. The study stated:

> *These findings suggest that the core content of a public alert and warning is: Tell people exactly what to do (guidance), describe why they should do it (hazard) and by when (time). Those who prepare future public alert and warning messages might consider emphasizing these content topics, but not to the exclusion of the others.*[30]

An agency should work with its PIO to develop messages and templates when possible. Having a template set that can be easily adjusted by users is a good solution.

[29] U.S. Department of Homeland Security. 2014. *Comprehensive testing of imminent threat public messages for mobile devices.* Accessed online January 22, 2019. http://www.hsdl.org/?view&did=763688
[30] U.S. Department of Homeland Security. 2014. *Comprehensive testing of imminent threat public messages for mobile devices.* Page 2. Accessed online January 22, 2019. http://www.hsdl.org/?view&did=763688

Polygons

The CAP message allows users to identify a specific area for the alert. This is done by including a geographic information system (GIS) polygon in the message. Systems may do this differently. Many systems include a map tool to draw an area; other systems will allow users to create a polygon and then import the coordinates into the authoring tool. When using a third-party system, caution should be exercised that the polygon is in an acceptable CAP format. Two examples of ineffective polygons follow:

- A polygon that consists of three points, two of which are the same. This polygon is a straight line. The message may go through but may not alert anyone.
- A polygon with multiple points, drawn by hand, similar to an existing CSEPP zone. While the message contains fewer than 200 points and is accepted by IPAWS-OPEN, it contains more than 100 points, so it fails WEA validation and is not sent out.

Wireless providers also use this information differently. Users should understand how wireless providers in their jurisdiction use this information so they can create effective messages. (Refer to the Wireless Provider Capabilities section of this guide for more information.)

Public Education

Public education is important to emergency management; including alert and notification into the existing education program is the best option. An agency's name or acronym should also be integrated into public education programs. This will allow the public to see and recognize the authority before it appears on their phone in an emergency message. Using the same alert log-off name or acronym in routine public messages will accustom the public to them.

An agency should educate the public on IPAWS and WEA before the need to use them arises. Preparing the public will increase the likelihood that the public will take actions to protect themselves. There are two great sources for education ideas. The IPAWS website[31] has links to public service announcements and other resources that can be used. Another good resource is the California Governor's Office of Emergency Services (OES) alerting website.[32] California has developed this website to educate its public on WEA and alerting. This website has good simple information in infographic format on how WEA works. The site also has some frequently asked questions and handouts.

Integrating IPAWS and alerting into pre-planned events is another way to educate the public. Spreading the word prior to and at events provides the public with more exposure to the alerts. Caution should be exercised to not over-use the alerting tools, which may lead the public to complain or even opt out of alerts. Appendix N: Model Public Affairs Communications Plan can be used to communicate a pre-planned event.

[31] Federal Emergency Management Agency. 2015. "Informational materials." Accessed online January 23, 2019. http://www.fema.gov/informational-materials

[32] California Governor's Office of Emergency Services. 2014. "Wireless emergency alerts." Accessed online January 23, 2019. http://www.calalerts.org/

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Appendix A: Implementation Checklists

Implementation checklists and directions for signing up for IPAWS can be found on the following pages and as an attached Word file.

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Planning Checklist

Current Environment

Define the Threats

Threat	Preparation Time	Onset	Geographic Impact Area	Severity	Likelihood

Define the Populations

Population	Available Communications Mediums	Language	Notes

Available Technologies

Technology	Target Population	Notes

Goals and Objectives

Goal 1	Objective 1.1:
	Objective 1.2:
	Objective 1.3:
Goal 2	Objective 2.1:
	Objective 2.2:
	Objective 2.3:
Goal 3	Objective 3.1:
	Objective 3.2:
	Objective 3.3:

☐ **Research systems**

Research the systems by system type; for example, research sirens, public address, and telephone notification systems, but not specific vendors.

☐ **Select systems to meet goals and objectives**

Determine what and where systems are needed. An effective solution will include multiple systems. Examples include the following:

- Sirens with public address at two city parks and the downtown walking mall
- Sirens on the edge of the city
- IPAWS for the entire county
- Subscription service for summer residents

☐ **Develop Alert and Warning Plan**

Develop a plan using the information gathered.

☐ **Review Plan with stakeholders**

Review the plan and refine as needed. More input often provides for a better plan.

☐ **Develop Memorandums of Understanding (MOUs) with neighboring jurisdictions**

Contact other jurisdictions to determine if service can be shared or used as a backup system for the selected systems.

Technology Checklist

☐ **Develop functional specifications for each system**

Define specific functional requirements for the system to meet the needs of the agency.

☐ **Select procurement method for each system**

Determine the procurement method to use (RFP, State contract, direct purchase, etc.).

☐ **Document life-cycle costs**

Conduct a life-cycle cost analysis to determine if the solution can be supported.

☐ **Procure system**

☐ **Install system**

☐ **Perform acceptance testing of system**

☐ **Train all users on the system**

☐ **Notify the public on the abilities of the system**

☐ **Begin operations with systems**

Operational Checklist

Develop policies, procedures, and guidelines checklist

- ☐ **Identify the team**
  - ☐ Assign team
  - ☐ Assign tasks
- ☐ **Research systems and needs**
- ☐ **Determine documents**
  - ☐ Decide documents and types
  - ☐ Outline
  - ☐ Assign writing tasks
- ☐ **Draft documents**
- ☐ **Review draft documents**
- ☐ **Publish**
- ☐ **Use**
- ☐ **Update**
- ☐ **Publish final document**
- ☐ **Annual review of all documents**

Training Checklist

- ☐ **Identify training needs**
  - ☐ Equipment
  - ☐ Procedures
  - ☐ IPAWS requirements
  - ☐ Message creation
- ☐ **Conduct training**
  - ☐ Equipment
  - ☐ Procedures
  - ☐ IPAWS requirements
  - ☐ Message creation
- ☐ **Document training**
  - ☐ Determine what must be documented
  - ☐ Develop documentation files
  - ☐ Document attendance, curriculum, and trainer
- ☐ **Conduct regular refresher training**
  - ☐ Equipment
  - ☐ Procedures
  - ☐ IPAWS requirements
  - ☐ Message creation

Exercise and Regular Use Checklist

- ☐ **Develop regular testing routine**
- ☐ **Identify regular uses**
  - ☐ Begin use on regular events
- ☐ **Integrate into exercise program**
- ☐ **Update operations**
  - ☐ Procedures
  - ☐ Training
  - ☐ Routine use plans

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Appendix B: IPAWS Adoption Checklist for Alerting Authorities

The IPAWS Adoption Checklist for Alerting Authorities document can be found as an attached PDF.

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Appendix C: Model Alert Planning Tool

The *Model Alert Planning Tool* document can be found as an attached Excel file. Directions for the tool can be found on the following pages.

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Alert and Notification Planning Tool

Alerting authorities can use this tool to capture the alerting needs of their jurisdiction and use this information to determine the best alerting and notification systems to use.

Each tab collects information on the needs of the jurisdiction. These can be used to develop a comprehensive alert and notification plan. This tool should be used by the planning group to capture the information. The first two tabs (Audience and Events) can be done in any order; afterwards, each tab should be completed in order. Many of the fields in the spreadsheet are shared between tabs, so use caution when deleting information. Your software may require an action to populate the information between tabs, like a "calculate" button on the lower left screen in MS Excel 2010.

Audience

List each potential audience in your jurisdiction that may need to receive an alert and notification. These should include residents, visitors, major gatherings, speech and hearing impaired, etc.

For each audience, list a description so that it is clear who the audience is. This may lead to having to add additional audiences. Each audience that requires a specific type of alert method should be listed separately. For example, while school children may be residents, they should not be grouped with elderly residents. This can be used to group based on audience and location such as schools, homes, care facilities, etc.

Events

List each potential event that may require an alert or notification to the public to protect life or property. Each event should be described.

As each event is described it may result in the addition of other events, or groupings of events to a single event group or type.

Event_Attributes

The events will populate the Event Attributes tab. For each event, attributes should be identified. The spreadsheet provides pull-down menus for each attribute. The following table lists the attributes. As this is being done, new events may become needed. Return to the Events tab to enter them.

If the User wants to change these, unhide columns “I” through “M” and edit the table.

Prep Time	Onset	Impact Area	Severity	Likelihood
None	Instant	Blocks	None	0% to 20%
Minutes	1 to 20 minutes	Cities	Minor	21% to 40%
Hours	21 to 60 minutes	Part of county	Moderate	41% to 60%
Days	Hours	County	Major	61% to 80%
	Days	Multi-county	Severe	81% to 100%

System_Audience

List all available alert and notification systems down column A. The audiences will populate across the top row. For each audience, mark the system that may be used to communicate to that audience.

This can be an "X," a "P" for primary and an "S" for secondary, or "1, 2, 3" for the order they can be used.

Next, list any proposed or in-progress systems and mark the audiences.

Lastly, make sure that all audiences have some means of communications.

Event_Systems

The systems will populate from the System_Audience Tab, and the events will populate the top row. For each event, mark the system that may be used to effectively communicate to the public for the event listed.

This can be an "X," a "P" for primary and an "S" secondary, or "1, 2, 3" for the order they can be used.

Advantages

This tab is optional, but can be helpful in the planning and, more importantly, in exercise planning. For each system, list advantages and disadvantages of the specific system. This will assist in selecting the best solutions for the final plan and procurement.

Then, list how the effectiveness of the system could be measured. This can be used to improve the use of the systems in the future and to develop exercise objectives.

Notes

The Notes tab is set up for use as a planning tool in a group setting. The Notes tab allows you to capture questions and information during the use of the tool. The note type is a pull-down menu (unhide Column "F" to edit). The source is who asked or will perform the action. Then the note text describes the issue.

This can also be used when you pass the data around for review to capture questions and comments as needed.

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Appendix D: Model IPAWS Requirements Document

The *Functional Requirements for Model County Alert Origination System* document can be found on the following pages and as an attached Word file.

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Functional Requirements for Model County Alert Origination System

August 2015

Table of Contents

Alert Authority System Specifications

Model County has determined that the alert and warning of emergencies and dangerous situations to residents and visitors of Model County is a critical function of public safety. To assist the county with ensuring the broadest distribution of alerts and warnings to the public, the county intends to adopt the Emergency Telephone Notification System (ETNS) and the Integrated Public Alert and Warning System (IPAWS) as resources.

The requirements in this document for a web-based alerting system for use by Model County to initiate telephone messages to the public switched network and Common Alerting Protocol (CAP) messages to the IPAWS-Open Platform for Emergency Networks (IPAWS-OPEN) gateway are based on the needs and expected functions of Model County. The system is expected to generate alerts for dissemination to the following:

- Telephones (wireline and voice over Internet Protocol [VoIP])
- Wireless phones (voice and text)
- Emergency Alert System (EAS)
- Wireless Emergency Alerts (WEA)
- National Oceanic and Atmospheric Administration (NOAA) Weather Radio HazCollect system
- Email
- Social Media

Definitions

Common Alerting Protocol (CAP): CAP is a digital format for exchanging emergency alerts that allows a consistent alert message to be disseminated simultaneously over many different communications systems. CAP is a standard of the Organization for the Advancement of Structured Information Standards (OASIS).

Collaborative Operating Group (COG): A Federal, State, Territorial, Tribal, or local alerting authority that applies for authorization to use IPAWS and is designated by IPAWS as a Collaborative Operating Group (COG). A COG may have members from multiple organizations (e.g., regional mutual aid organizations).

Emergency Notification System (ENS): ENS is a set of functions used by an alerting authority to facilitate one-way dissemination or broadcast of messages to one or many groups of people. ENS is used to notify or alert a group of individuals of a pending or existing emergency situation.

Integrated Public Alert and Warning System (IPAWS): IPAWS is a modernization and integration of the nation's alert and warning infrastructure that saves time when time matters, protecting life and property.

IPAWS–Open Platform for Emergency Networks (IPAWS-OPEN): IPAWS-OPEN is a Federal alert aggregator that receives and authenticates messages transmitted by alerting authorities and routes them to existing and emerging public-alerting systems.

System: For this document, a system is a set of hardware, software, and services used by an alerting authority user to compose, send, and/or receive an alert message to and from IPAWS-OPEN.

General Specifications

- All equipment provided shall comply, where applicable, with industry standards. Examples of these standards are Underwriters Laboratories (UL) approval, the American National Standards Institute (ANSI), Open Systems Interconnection (OSI), and the Institute of Electrical and Electronics Engineers (IEEE).
- All systems shall be capable of complying with the Federal Communications Commission (FCC) Communications Security, Reliability and Interoperability Council (CSRIC) IV's Work Group 3 (WG3) EAS Security Subcommittee Report best practices.
- The system shall be able to operate in ambient temperatures between 35 degrees (°) Fahrenheit (F) and 100° F and relative humidity from 0 percent to 95 percent for a period of at least 48 hours without failure or reduced functionality.
- The system shall have a method (such as email or text notifications to staff) for reporting monitoring, logging, and discrepancy capabilities necessary to support troubleshooting and ongoing operations and maintenance.
- The system shall be able to interface with other device management or monitoring systems using standard protocols such as Simple Network Management Protocol (SNMP) or Common Management Information Protocol (CMIP).
- There shall be two hard (i.e., paper) copies and one soft (i.e., CD or DVD) copy of all documentation relating to the system. Documentation shall include the following at a minimum:
  - Manufacturer technical and maintenance manuals required to support the solution
  - Operations documentation, which must include backup and recovery procedures and recommended maintenance processes
  - Users' manuals for all systems, sub-systems, and applications
  - Documentation supporting the operating system (OS)
  - Final as-built drawings; these drawings can be provided in Visio or another agreed-upon format
- The system shall be capable of posting text from the alert to social media sites, including, at a minimum, Facebook and Twitter.
- The system shall be able to send both sent and received alerts to an email address or distribution list with the full information and not to a link to another location.

- The system shall be able to send alerts to wireless phones via text messaging.

User Display Specifications

- The system shall have the ability to adjust colors per user profile log-in to aid users that have difficulties with some colors.
- The system shall have the ability to allow user changes or administration to lock the screen configuration. This feature must be controlled by the user's log-on profile (i.e., the screen configuration could be created and modified by all users or could be locked and only configurable by a system administrator).
- The system shall use colors that are visible to a visually impaired or colorblind user.
- The system shall support features used by visually impaired call takers to magnify or augment parts of the screen.
- The system shall be capable of using a standard IBM PC 101–style keyboard.
- The system shall be capable of using a standard three-button scrolling mouse.
- The system shall require the user to navigate not more than three screens to create and send an alert.
- The system shall provide visual alerts for specific CAP elements and values configured in the system by the user.
- The system shall provide the ability to connect external visual and audible alert devices such as strobes, buzzers, and email or text messages.
- If the system operates on another hardware system such as a personal computer (PC), the system shall include an OS. The OS supporting the PC shall be fully supported by the system for a minimum of 5 years after acceptance.
- The central processing unit (CPU) must be configured with robust and reliable processors along with all necessary data and audio interfaces. The CPU must also be configured with properly sized power supplies, memory, and hard drives to support 100 percent of all software installed on the system without reducing user functions.
- The system shall include malware and antivirus protection for all servers and workstations in the system. The system shall support periodic scheduled malware and antivirus updates.
- The system shall support the ability to print screens, files, forms, and logs to an external printer.
- The system shall support a master timing source from an agency (i.e., local time source) or external (i.e., Internet or radio) source. The master timing source shall support, at a minimum, Ethernet Network Timing Protocol (NTP) and other sources defined in National Emergency Number Association (NENA) 04-002, *PSAP Master Clock Standard*.
- The system shall display a message preview to the user of entered data in the format it will most likely be displayed to the public prior to sending the alert for each distribution channel selected.

- Message elements shall be presented to the user in a pull-down list where defined values are known.
- Pull-down lists shall be limited by allowable elements of the distribution channel selected.
- Alert distribution channels available to the user shall be configurable by the system administrator for each user or user groups.
- The system shall allow all configuration settings and changes from the keyboard.

User Interface Specifications

- The system shall require unique user log-ons. Each user accessing the solution or workstation shall be required to log on with a user name and password.
- Passwords shall be at least six characters long and allow the use of letters (lowercase and capital), numbers, and special characters. Users shall be able to define or create their own unique passwords.
- The system shall support at least 100 unique user names for log on.
- The system shall allow an administrator to set levels of permissions to access components of the system, such as limiting access to a specific COG or changing templates to specific personnel.
- The system shall allow an administrator to set at least five permission levels to access components of the system, such as limiting access to a specific COG or changing templates to specific personnel. These levels will include the following:
  - Administrator: full access
  - Power User: access to all distribution methods
  - General User: access to distribution but not IPAWS
  - Agency Users: limited access to distribution with the ability to limit access to groups or parts of the database
    - This level shall be able to be used for multiple separate agencies
  - Limited User: access to create, edit, and use predefined call out lists of agency resources
- The system shall configure the workstation with user-defined personalized features that the user has created in his or her profile and log-on permissions.
- The system shall allow the administrator or authorized user to pre-program at least 200 template messages. It is desirable that the messages be grouped into different situation types to aid in quicker response.
- The system shall allow the administrator or authorized user to pre-program at least 50 pre-defined CAP v1.2 <area> elements for specific locations or polygons. It is desirable that the areas be grouped to aid in quicker response.

- All pre-programmed elements shall be available for all COGs configured in the system without requiring copying.
- The system shall allow the user to select from multiple messages and multiple location templates for a single alert, such as click something for shelter in place for one area, click something else for evacuation in another area, and click something else for standby. Having a template with a checklist where boxes could be checked and where text-to-speech would recognize what boxes are checked would be ideal.
- The system shall meet uptime of 99.995 percent or better.
- The system shall be able to generate messages using sub-county Federal Information Processing Standard (FIPS) codes.
- The system shall be able to generate message locations using an internal or external mapping function to create polygons.
- Selected polygons shall be checked to ensure that at least one tower is included in the activation area.
- The system shall support a minimum of two separate COGs to be configured in the system.
- Each screen shall clearly identify the COG from which the alert will be sent to prevent errors.
- The system shall permit the user to switch between COGs without requiring the restart of the system or logging off.
- The system shall be able to allow the administrator to configure the system to default to the test COG.
- The system should support configuration of up to 10 separate COGs for backup purposes.
- The system shall automatically perform validations of messages to meet CAP, IPAWS, and dissemination system requirements and provide a visible alert and the reason and/or recommended corrections when the requirements are not met.
- The system shall pull time and dates from the system time automatically.
- The system shall allow the user to change the date and time after pre-populating from the system.
- The system shall allow the administrator to set the default duration.
- The system shall automatically calculate the time intervals to meet the required formats.
- The system shall support user access from at least two remote sites in addition to the installed location.
- The system shall support at least 20 simultaneous users.
- The system shall provide automatic log-off of users for inactivity configurable from 1 minute to 12 hours.

- The system shall continue to operate, receive, and forward, if configured, alerts while no user is logged on.
- The system hardware shall be located in a secure facility with restricted and monitored access.
- The system shall be a set of hardware and software that can be located within the respective agency's facility.
- The system shall be able to be connected to a local area network (LAN).
- The system shall provide at least two methods of access (e.g., Internet, phone, or email).
- The system shall provide text-to-speech abilities for messages, with custom dictionary capability for proper pronunciation of local words.
- The system shall provide an audio preview of the message from the message-creation page.
- The system shall be able to record audio messages from the message-creation page.
- The system shall automatically fill in elements from the COG information.
- The system shall display a message that contains errors and possible solutions for improper alerts when a user attempts to send the alert but provide the capability for the user to override errors and send the alert.
- The system shall be able to be configured with the method for which each carrier implements WEA in the COG area to allow the user to select the appropriate area in which to send an alert.
- The system shall display, by carrier, the towers that should be activated in the selected area.
- The system shall display if a selected area does not include all carriers in the area.
- The system shall display a message before sending an alert asking the user if they are sure they want to send the message.
- The user shall be able to review all status messages returned from IPAWS-OPEN.
- The user shall have one-click access to a message log to review all actions of the system and IPAWS-OPEN.

IPAWS Interface Specifications

- The system shall be able to generate a message in CAP v1.2 and meet the CAP v1.2 USA IPAWS profile v1.0.
- The system shall be able to send a CAP– and IPAWS–compliant message to both the production and Joint Interoperability Test Command (JITC) test IPAWS-OPEN.
- The system shall be tested, and the vendor shall provide proof that the system is able to send messages through IPAWS-OPEN to the EAS gateway.

- The system shall be tested, and the vendor shall provide proof that the system is able to send messages through IPAWS-OPEN to the WEA gateway.
- The system shall be tested, and the vendor shall provide proof that the system is able to send messages through IPAWS-OPEN to the Non-Weather Emergency Message (NWEM) gateway.
    - This requires that the vendor has tested with NOAA and the proposed solution is approved and currently delivering calls to the NOAA weather radio NWEM system via IPAWS-OPEN.
- The system shall be able to send messages through IPAWS-OPEN to the IPAWS All-Hazards Information Feed gateway.
- The system shall be able to send COG-to-COG messages through IPAWS-OPEN.
- The system shall have a simple (i.e., no more than three clicks) means to retrieve sent messages and be able to send an IPAWS cancel or modify message to IPAWS-OPEN.
- The system shall be able to monitor alerts from other COGs via the Internet feed.
- The system shall be able to relay alerts from other COGs.
- The system shall be capable of monitoring at least two other alert systems, such as the National Weather Service (NWS) weather radio, LP1 stations, and satellite stations.
- The system shall be able to send alerts to a local radio transmitter.
- The system shall be able to relay alerts from other sources to a local radio transmitter.
- The system shall be capable of delivering CAP message formats from received and generated alerts to third-party systems such as message boards and other computer systems.
- The system shall be capable of attaching files such as audio, video, or pictures to the message in a manner available to the various distribution channels.

Mapping Interface Specifications

- The system shall be able to display a map of the COG and surrounding areas to the user.
- Mapping functionality shall include freehand, polygons, radius, and intersection and shall list features in that polygon after drawn. Features that shall be viewable include telephone devices (primarily landline but also cell/VoIP that have opted in); cell phone towers; and residents and/or facilities for individuals with disabilities or access or functional needs, such data to be collected by the county.
- The mapping function shall provide a dynamic display and rendering of different layers based on zoom level.
- The system shall accommodate the use of accepted aliases for street names.
- The mapping function shall allow users to select an area on the map to which an alert will be sent.

- The mapping function shall automatically take the selected area and generate a CAP <area> element to include in the alert message.
- The system shall automatically validate the CAP <area> based on the distribution channel, particularly WEA.
- The system shall import Environmental Systems Research Institute (Esri) map files.
- The map import function shall be able to be performed by the agency user and not require conversion to other formats.
- The system shall automatically take Esri map files and generate a CAP <area> element template that can be included in the alert message.
- The system should support imagery using the multi-resolution seamless image database (MrSID) encoding algorithm.
- The system shall automatically determine if a selected area extends beyond COG boundaries and notify the user prior to sending the alert.
- The system should be able to input a polygon in shape (.SHP) and Keyhole Markup Language (.KML) files from another source (such as WebPuff™) to generate a CAP <area> element.
- The system shall be able to look up required NWEM geocode values using the "getNWEMAuxData" method on the IPAWS-OPEN interface.
- The system shall be able to look up an IPAWS–configured Event Code and geocode permissions by distribution channel using the "getCogProfile" method on the IPAWS-OPEN Interface.
- Telephone-number databases shall be linked to the map and geocoded to the map database.

Logging and Reporting Specifications

- The system shall have comprehensive logging and reporting capabilities to detail the activity on the system. Actions that shall be logged include, at a minimum, the following:
  - User log-on and log-off
  - User activity (adds, deletes, or changes to data) while logged on
  - All alerts sent
  - All alert and system messages received
  - Alerts from other COGs
  - Visible data to the user (polygons, alerts, etc.)
- The logging file and process shall be performed in a manner that creates a legal record of the activities and is not editable by users. All records shall have the "write once read many" (WORM) attribute.
- The system shall provide real-time progress reports of all alerts.

- The log shall be exportable in part or in whole to an electronic readable and editable format for reporting purposes.
- The system shall be able to log and store at least 6 months of activities. For a CSEPP event, this can include numerous alerts for different areas and repeated at 8- to 15-minute intervals for the duration of the event, which may last for hours.
- The system shall be able to query the data to create, save, and print reports in an ad hoc fashion.
- The system shall be able to generate scheduled reports automatically.
- The system shall be able to print reports to electronic files and printers.
- The system should be able to email reports.
- ENS reports shall also include the following:
  - Time started, duration, and time ended
  - Number of call attempts
  - Results of each call (e.g., busy, no answer, answering machine)
  - Numbers-called list
  - Number of successful calls
  - Agency and user that generated calls

ENS Specifications

- The system shall allow the user the ability to listen to the emergency notification message prior to a notification being deployed without having to send an alert.
- The system shall comply with all Americans with Disabilities Act (ADA) requirements. This shall include the ability to reach Telecommunications Devices for the Deaf (TDDs) (both Baudot and ASCII) during a field-event launch.
- The system shall have the ability to send notification message to users in a text format as well as voice.
- The text-to-speech program shall allow for the use of custom dictionaries for local pronunciation.
- The system shall permit an audio message to be created via telephone or a computer and used instead of text-to-speech.
- The system shall have a comprehensive interactive notification system for internal call lists and internal departmental communication.
- It is preferable that the system has the ability to deliver messages in multiple languages, at a minimum English and Spanish, based on the preference of the registered receiver.
- The system shall match at least 99.99 percent of related 9-1-1 records based upon any geographic selection.

- The system shall redial or resend alerts to numbers that may not answer on the original call. The system shall redial a minimum of up to three times and be configurable by the user or administrator.
- The system shall allow the user to start a new set of calls to only those not reached in the previous message.
- The system should have a method to start recording shortly after the recipient picks up and not have a delay to wait for answering machines. The message may restart on an answering machine beep.
- The system shall allow the administrator to tag information as persistent and not overwrite this data on updates.
- The system shall allow the administrator to develop static call lists such as call outs for additional personnel or special services, such as a Specialized Weapons and Tactics (SWAT) team.
- The system shall be able to generate call lists from additional data elements in the record such as business address, volunteer organization, etc.
- The system shall have the ability to adjust the number of calls per minute transmitted to specific areas, services, or providers so as to not overload the delivery systems.
- The system shall support all telephone types, including plain old telephone system (POTS), wireless, and VoIP subscribers.
- The system shall use a local call back number and display that number as the caller identification (ID) on alerts. The systems shall use multiple local call-back numbers and display that number as the caller ID on alerts.
- The system shall provide a call-back feature where a recipient can call to get the current alert.
- The system shall provide a feature to allow the recipient to select a number and be transferred to a recording with additional information.
- The system shall allow the sender or other authorized user to stop, pause, or cancel an alert in progress of notification.
- The system shall provide the voting or polling ability (such as pressing 1 for “no” or 2 for “yes”) for the recipients of calls.

ENS Data Specifications

- Data stored in the vendor’s database for the use of an agency shall be considered the property of the agency and not be shared with other entities without written approval.
- The data stored in the vendor’s database for the use of an agency shall be available to the agency on request in an agreed-upon electronic format.
- The system shall use the telephone numbers provided in the 9-1-1 database.

- The selected vendor shall coordinate telephone record uploads and periodic updates, at least quarterly, with the Incumbent Local Exchange Carrier (ILEC); more frequent updates are preferred.
    - Final frequency of updates will be negotiated with the selected vendor based on cost.
- The system shall have the ability to upload contact data in a bulk format from common files (e.g., CSV, spreadsheet)
- The system shall have an "opt-in" program that allows residents to opt in their cell, VoIP, or other phone.
- The system shall be able to have the resident associate his or her phone number with multiple geographic addresses (home, work, school, etc.) that shall be validated as a valid address through the system.
- The database for "opt-in" numbers outside of the 9-1-1 automatic number identification (ANI) database shall be maintained by the selected vendor and shall be updated to the system at least once a day.
- The system shall have the ability for the administrator to add additional fields or data elements to the database.
- The selected vendor shall provide data security and confidentiality for all data provided by the county, individuals, and other providers. The vendor shall not use this data for other purposes, and a privacy policy shall be provided to the agency and persons "opting in."
- The system shall allow users with permissions to perform searches on the data in the database for all fields, including, at a minimum, phone number, name, and address

Training Specifications

- The selected vendor shall provide at least two onsite user training sessions for xx students on the operation of the system. Each trainee shall be provided with a hard copy of training materials.
- The selected vendor shall provide at least one system-administrator training session for up to five students on system management. Each trainee shall be provided with an electronic copy of training materials.
- The selected vendor shall provide at least one face-to-face train-the-trainer user-training session for up to six students. Each trainee shall be provided with an electronic copy of any training materials.
- All training shall include a component of sending alerts to the IPAWS Lab at the JITC to view the video feed of alerts received from the deployed system. The selected vendor is responsible for coordinating this with the JITC.
- The selected vendor shall deliver two hard copies and two soft (i.e., CD or DVD) copies of all training materials to the agency for reference.

- All electronic materials shall be in an unlocked format, which will allow for cutting, pasting, printing, and other use as needed by Model County and other users of this system.
- The selected vendor shall provide 24/7/365 phone customer support for users to request assistance in using the system. This can include walking a user through the process of creating an alert or answering non-emergency questions.
- Web, computer, and/or video training should be available to users as a regular refresher on the processes and procedures of using the system.
- The vendor should have available regular refresher training on the systems and new features and functions. This should be available at least annually. Frequency and delivery methods will be negotiated, but vendors shall describe the methods and cost options.
- A training interface of the system is required. Users must be able to perform all functions without sending a live alert. The training interface must closely mimic the "live" version but be easily identified as a "training only" interface.

Warranty and Maintenance Specifications

- The selected vendor shall provide updates and upgrades that are released for the system for a period of at least 2 years after installation at no additional charge.
- The selected vendor shall support the full functions of the purchased system on an annual renewal basis for at least 5 years without requiring the agency to purchase upgrades or change contract terms. For example, if a feature is included in the service but then later is moved to a separate module by the vendor, Model County expects that the function will still be available to use.
- The system shall include a 2-year replacement warranty for all hardware, software, and ancillary equipment commencing upon the final acceptance of the system. The warranty shall provide for resolution of all faults or malfunctions at no additional cost (including shipping) to the agency. The agency reserves the right to begin the warranty period earlier if only minor punch-list items remain unresolved and will provide notice, in writing, to the vendor if this is agreeable.
- The vendor shall provide 24/7/365 phone support for priority one and two faults. Faults are identified as follows:
    - **Priority One Faults** are major system faults that render the system completely inoperable. These faults shall be resolved within 4 hours.
    - **Priority Two Faults** consist of major and minor faults that significantly reduce the solution performance and ability to function. These faults shall be resolved within 24 hours.
    - **Priority Three Faults** are minor system faults that marginally affects system performance and functionality. These minor faults are operational in nature. These faults shall be resolved within 5 work days.

  - **Priority Four Faults** are a combination of minor system faults or system-user questions. These are faults that have minimal or no effect on system performance and functionality. These faults shall be resolved within 10 business days.

- The selected vendor shall provide procedures for initiating, tracking, and resolving trouble reports within the limits for each priority level.
- The selected vendor shall provide an escalation plan to the agency. This plan shall include documentation of the escalation process along with names, titles, and contact information and include the after-hours escalation process if different from normal work hours.
- The selected vendor shall provide data backups of all databases, configurations, and settings.

IPAWS System Summary Worksheet

In the "Response" column on the following pages, respondents will indicate with one of the allowable responses (described below) if their solution will provide this function. Each previous requirement, detailed in the specification sections, is listed in the worksheet on the following page. Respondents should review the detailed requirements listed above prior to completing the worksheet.

The three allowable responses are as follows:

- **Comply**: This indicates that the solution fully provides for the functions listed in the requirement section of this document.
- **Partial Comply**: This indicates that the solution does part of the function or may accomplish the same function in another manner.
- **Not Comply**: This indicates that the solution is not capable of performing the required function.

All Partial Comply or Not Comply responses require an explanation of the response in the notes section.

General Specifications

Requirement	Response	Notes
Meets industry standards		
Complies with CSRIC EAS Security best practices		
Can operate in extreme conditions		
Email or text for reporting trouble		
Interface with other device management or monitoring systems		
Provide documentation		
Posting to social media		
Posting to email		
Posting to text message		

User Display Specifications

Requirement	Response	Notes
Able to adjust screen colors		
Ability to lock screen configuration		
Colors visible to visually-impaired or color-blind users		
Support features for vision impaired users		
Uses standard keyboard		
Uses standard 3-button mouse		
Navigate no more than 3 screens		
Visual alerts for CAP elements		
Can connect external devices		
PC OS supported for 5 years		
CPU supports 100% of all software installed		
PC has malware/anti-virus and is updated		
Supports printing		
Supports master timing source		
Previews message to user		
Message elements presented in pull-down list		
Pull-down lists limited by allowable elements		
Alert distribution channels configured per user		

Requirement	Response	Notes
All configuration can be done by keyboard		

User Interface Specifications

Requirement	Response	Notes
Require user log on		
Password at least 6 characters		
Supports at least 100 user names		
Administrator can define user permissions		
At least five permission levels		
Workstation configurable with user-defined features		
At least 200 templates		
At least 50 pre-planned polygons		
All templates available in all COGs		
Select multiple messages and areas		
99.995% up time		
Use sub-FIPS codes		
Generate area from internal or external mapping function		
Check polygons for wireless provider towers		
Support at least 2 COGs		
Clearly identify COG on page		
Switch between COGs without restart		
Configure to default to test COG		
Support up to 10 COGs		
Automatically validate CAP elements		
Automatically pull time and date		
Allows user to change date		
Ability to set default duration		
Automatically calculate time intervals		
Support user access from at least two remote sites		
Supports at least 20 simultaneous users		
Automatically log off user for inactivity		
Continue to operate when logged off		
Located in secure facility		

Requirement	Response	Notes
Set of hardware and software located within agency's facility		
Connect to LAN		
At least two methods of access		
Provide text-to-speech with custom dictionary		
Provides audio preview to user		
Able to record audio from message page		
Complete CAP elements from COG data		
Display errors and solutions for CAP elements		
Configure based on WEA deployment method		
Display carrier and towers that are in alert area		
Display if a carrier is not included in alert		
Display message to verify the user wants to send		
Able to display to user IPAWS-OPEN status messages		
One-click access to message log		

IPAWS Interface Specifications

Requirement	Response	Notes
Able to generate CAP v1.2 messages		
Send CAP- and IPAWS-compliant messages to production and JITC test IPAWS-OPEN		
Tested, with proof of messages through IPAWS-OPEN to EAS gateway		
Tested, with proof of messages through IPAWS-OPEN WEA gateway		
Tested, with proof of messages through IPAWS-OPEN to NWEM gateway		
Send messages through IPAWS-OPEN to IPAWS All-Hazards Feed gateway		
Send COG to COG messages		

Requirement	Response	Notes
Retrieve sent message and send cancel or modify messages to IPAWS-OPEN		
Monitor alerts from other COGs		
Relay alerts from other COGs		
Monitor at least two other alert systems		
Send alerts to local radio transmitter		
Relay alerts from other sources to local radio transmitter		
Delivering CAP message formats to third-party systems		
Ability to attach files to message		

Mapping Interface Specifications

Requirement	Response	Notes
Able to display map		
Mapping functions include freehand, radius, etc.		
Dynamic display of layers		
Supports alias street names		
Supports user selection on the map		
Mapping generates CAP <area> element		
Automatically validate CAP <area>		
Supports import of Esri files		
User can perform map data import		
Support creation of CAP <area> elements from Esri files		
Supports MrSID		
System identifies if area selected is outside of COG boundaries		
Supports import of .SHP and .KML files		
Performs “getNWEMAuxData”		
Look up an IPAWS configured Event Code and geocode permissions using “getCogProfile”		
Telephone number database is geocoded to map		

Logging and Reporting Specifications

Requirement	Response	Notes
System logs activities		
Log is legal record		
Real-time progress reporting		
Log is exportable		
Log holds at least 6 months data		
Able to query data and run ad hoc reports		
Generate scheduled reports		
Print reports to printer and electronic file		
Able to email reports		
ENS reports include call data		

ENS Specifications

Requirement	Response	Notes
Permits user to listen to message before sending		
Compliant with ADA		
Supports text as well as voice		
Text-to-speech with custom dictionaries		
Audio message created via telephone or computer		
Supports call lists		
Supports multiple languages		
Matches 9-1-1 data to map		
Supports redial		
Supports new call to those not reached		
No time delay for message starts		
Supports persistent data		
System administrator can create call out lists		
Supports creation of additional data fields		
Adjust calling speed		
Supports all phone systems		
Provides local call back number		
Supports call backs from public		

Requirement	Response	Notes
Supports transfer for more information		
Permits stop, pause, or cancel		
Supports voting or polling		

ENS Data Specifications

Requirement	Response	Notes
Data is property of agency		
Data is available upon agency request		
Uses telephone numbers in 9-1-1 database		
Quarterly updates with ILECs		
Uploads data in bulk format		
"Opt-in" program for residents		
"Opt-in" program associates with multiple geographic addresses		
Resident-provided "opt-in" numbers maintained by vendor		
Allows addition of fields		
Provides data security and confidentiality		
Provides ability for searches		

Training Specifications

Requirement	Response	Notes
Provide user training		
Provide system administrator training		
Provide train-the-trainer training		
JITC test lab component		
Provide training materials		
Training materials unlocked		
Provide 24/7/365 phone support		
Web, computer, video refresher training		
Refresher training on systems and new features/functions		
Training interface		

Warranty and Maintenance Specifications

Requirement	Response	Notes
Provide updates and upgrades		
Support functions for 5 years		
2-year replacement warranty		
Provide 24/7/365 maintenance support		
Provide trouble reporting process		
Provide escalation plan		
Provide back up of all data		

Appendix E: Model EAS Survey Form

The EAS Survey Form can be found on the following pages and as an attached Word file.

The remainder of this page intentionally left blank.

IPAWS EAS Survey

Station

Information Requested	Provide Information
Name	
Address	
Business Phone	
24x7 Phone	
FCC License and Frequency	
Counties in Broadcast Area	

IPAWS Point of Contact

Information	Provide Information
Name	
Title	
Address	
Business Phone	
Email	

Is your station staffed 24x7?	

IPAWS/EAS Decoder

Question	Answer
Type of decoder used	
Is the encoder text-capable?	
Is the encoder audio-capable?	
Is the encoder video-capable?	
How often do you poll IPAWS-OPEN?	

Do you monitor and rebroadcast the following? (Please list the station.)

System	Yes/No?
EAS from PEP?	
EAS from SR1?	
EAS from SR2?	
EAS from an LP1?	
EAS from an LP2?	
EAS from another source? (List sources.)	

System	Yes/No?
IPAWS feed from the Internet?	
National Weather Radio (NWR)?	
Other feeds?	

Are any sources set as primary? If so, please list the order.	

What happens to the message from multiple sources? (For example, a tornado warning from NWR and an SR1 or LP1 Station.)	

How is your encoder configured for the following event codes? (List the counties it filters for, and the action to re-transmit if automatic or manual. If manual, what action must take place to activate?) Add additional events as needed.

Event	Description	Counties	Operation Mode
EXAMPLE	*Example of the table*	*County X, Y, and Z*	*Automatic, manual, delay, etc.*
CDW	Civil Danger Warning		
CEM	Civil Emergency Message		
EQW	Earthquake Warning		
EVI	Evacuate Immediate		
FRW	Fire Warning		
HMW	Hazardous Materials Warning		
LAE	Local Area Emergency		
LEW	Law Enforcement Warning		
SPW	Shelter in Place Warning		
TOE	911 Telephone Outage		
RMT	Required Monthly Test		
RWT	Required Weekly Test		

Does your device re-transmit both ‘Description’ and ‘Instruction’ CAP elements?	

Are you willing to coordinate additional testing from local agencies in the community?	

Is there any other information the County may need to know?	

Appendix F: Model WEA Survey Form

The WEA Survey Form can be found on the following page and as an attached Word file.

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WEA Survey

Carrier: _____

24/7 Contact Number: _____

County: _____

Notes:

IPAWS POC:

Name: _____

Address: _____

Phone: _____

Email: _____

Re-transmit Rate: _____

Can the re-transmit rate be reduced in critical counties? _____

IPAWS Implementation:

Describe the way IPAWS messages are processed for this county
(by FIPS, by coordinates, by polygon coordinates).
Do the coordinates have to include the tower latitude/longitude or just the sector?

Common Tower Information (this should match the E9-1-1 information)

County	Carrier Name Field	House Number Field	House Number Suffix	Prefix Directional	Street Field/Name	Street Suffix	Post Directional	Community Field	State (2 char. Max)	Location (20 char. Max)	FIPS Assigned for IPAWS	Cell Tower Latitude (in decimal degrees) (+/- 2 before decimal/6 after decimal)	Cell Tower Longitude (in decimal degrees) (+/- 3 before decimal/6 after decimal)	Cell Sector Orientation/ Azimuth (degrees, N=0)	Cell Sector Beam Width (degrees)	Cell Sector Compass Orientation	Avg. Cell Sector Radius Range (Miles)

Appendix G: IPAWS Toolkit for Alerting Authorities

The IPAWS Toolkit for Alerting Authorities can be found as an attached PDF.

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Appendix H: Model Alert and Notification Plan

The *Model Alert and Notification Plan* can be found on the following pages and as an attached Word file.

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Model Alert and Notification Plan for Integrated Public Alert and Warning System (IPAWS)

April 2014

In [Jurisdiction], the Emergency Alert System (EAS) is a system used by the Emergency Operations Center (EOC) to send alerts and notifications. The National Weather Service (NWS) has been the primary user of the technology to send severe weather warnings over its National Oceanic and Atmospheric Administration (NOAA) Weather Radio System. EAS has not seen wide usage at a local level in [State] for many years. EAS responsibilities have been shared by the [State] Office of Emergency Management (OEM) EOC, NWS, and the [State] Broadcasters Association since the inception of EAS in the 1990s. Although designed to be a bottom-up system, it has remained a top-to-bottom warning system on a regional and/or statewide basis. Local use has been spotty. Local warning in rural areas with EAS is hampered by the lack of broadcast radio stations. Many jurisdictions do not have a local radio station, and many local stations do not originate their programming. The result is an EAS system that is not local. Integrated Public Alert and Warning System (IPAWS) technology supports local warning.

Historically, the public depended exclusively on radio and television to receive alerts, but current research shows that radio and television reach less than 40 percent of the population during the work day. Less than 12 percent of the population is watching television in the middle of the night, and only 5 percent is tuned to the radio. Television and radio will continue to be valuable sources of public information, but their reach is decreasing. Furthermore, these information sources can only target a State or regional area and do not encompass alerting for people who do not speak English or those with disabilities and other access or functional needs, including the 29 million Americans with hearing impairment.

Today, the Internet and cellular phones are increasingly popular and, therefore, are valuable sources of information. While television remains the most popular source for information, the Internet ranked either first or second at both work and home.

Effective this date in accordance with [authority reference], the [Agency] Alert and Notification Plan is hereby approved.

_____

Name

_____

Date

_____

Title

_____

Agency

Record of Changes

All changes are to be annotated on the master copy of the IPAWS Implementation Plan. Should the change be significant in nature, updates shall be made to applicable Web pages. If not, changes will be reviewed and incorporated into the plan during the next scheduled update.

Date Posted	Change	Page/Paragraph/Line	Recommending Agency / Individual

Table of Contents

Executive Summary

The Integrated Public Alert and Warning System (IPAWS) is designed to improve public safety through the rapid dissemination of emergency messages to as many people as possible over as many communications devices as possible. To accomplish this, IPAWS is expanding the traditional Emergency Alert System (EAS) to include more modern technologies. At the same time, the Federal Emergency Management Agency (FEMA) is upgrading the alert and warning infrastructure so that, no matter what the crisis, the public will receive life-saving information.

The advent of new media has brought a dramatic shift in the way the public consumes information. IPAWS capitalizes on multiple electronic media outlets to ensure that the public receives life-saving information during a time of national emergency.

Situation

Authority

Authoritative information for this plan is garnered from the following:

- Comprehensive Preparedness Guide 101, November 2010
- Executive Order 13407, Public Alert and Warning System, dated June 26, 2006
- National Incident Management System, December 2008
- National Response Framework (NRF), January 2008
- Post-Katrina Emergency Management Reform Act 2006 (S.3721—109th Congress)
- Robert T. Stafford Relief and Emergency Assistance Act (42 U.S.C. 5121, et seq.)
- *Insert* [*State*] *Statutes related to alert and warning*
- [State] Emergency Operations Plan (EOP)

Purpose

Broadcasting alerts and warning to the population is one of the primary responsibilities of government at all levels. This system began during the Cold War when the threat of nuclear war was high, and it provided a means for the President to address the public. Over time, the system was expanded to cover other threats such as natural disasters (flooding, hurricanes, severe weather, tornados, etc.). Other Federal agencies such as the National Weather Service (NWS) were allowed to broadcast more localized alerts and warnings.

With the rapid growth of new communications methods, the need to upgrade EAS was recognized. In 2006, the modernization of the nation's EAS along with integration to other multiple communications pathways for alerting the public was envisioned in Executive Order 13407. The Integrated Public Alert and Warning System (IPAWS) Program Office was established by FEMA in 2007 to implement the vision of the Executive Order. Beginning in 2011, initial IPAWS capabilities were deployed, providing public safety authorities at all levels of government integrated access to send

alerts to EAS, the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, a new cellular alerting capability called Wireless Emergency Alerts (WEA), Internet applications, and future alerting channels and communications technologies yet to be developed. IPAWS offers authorities a broader range of message options and multiple communications pathways and increases the capability to alert and warn communities of all hazards that have an impact on public safety.

IPAWS seeks to provide timely alert and warning to American citizens, residents, and visitors in the preservation of life and property. The IPAWS national mission statement identifies the intent:

> *Provide integrated services and capabilities to Federal, State, territorial, tribal, and local authorities that enable them to alert and warn their respective communities via multiple communications methods.*

To successfully accomplish this mission, three program goals have been outlined:

- Goal 1: Create and maintain an integrated interoperable environment for alert and warning
- Goal 2: Make alert and warning more effective
- Goal 3: Strengthen the resilience of IPAWS infrastructure

The IPAWS architecture and associated elements can be found in Appendix A.

Since 2006, several small-scale IPAWS tests and the first-ever nationwide EAS test have occurred. The next phase is to expand IPAWS to incorporate State structures through a memorandum of agreement (MOA) that will govern the relationship between State-level Collaborative Operating Groups (COGs) and FEMA.

This Implementation Plan is designed to provide direction and guidance for the integration of IPAWS into existing emergency communication systems with the ultimate objective of becoming the primary system for communicating with the general public during local disasters and/or emergencies or a national-level emergency incident.

IPAWS Alerting Plan Detail

IPAWS messages may be used to alert the public to events that pose a significant threat to life and/or property. **IPAWS is a public warning system, NOT a public information system.** The President of the United States issues presidential messages. State Police issues AMBER Alerts. NWS issues critical weather warnings.

Alerts issued by an authorized public safety agency using IPAWS may be directed to three dissemination channels: broadcast media (EAS), weather radios (non-weather emergency messages [NWEM]), and cell phones via WEA. Some alerts may only need to go to one channel; other alerts may go to two or all three channels.

The primary capability of a WEA (cell phone) message is to quickly alert recipients that an event is occurring (or will occur) in the geographic area in which the recipient is located. WEA limits the message to 90 characters at one time.

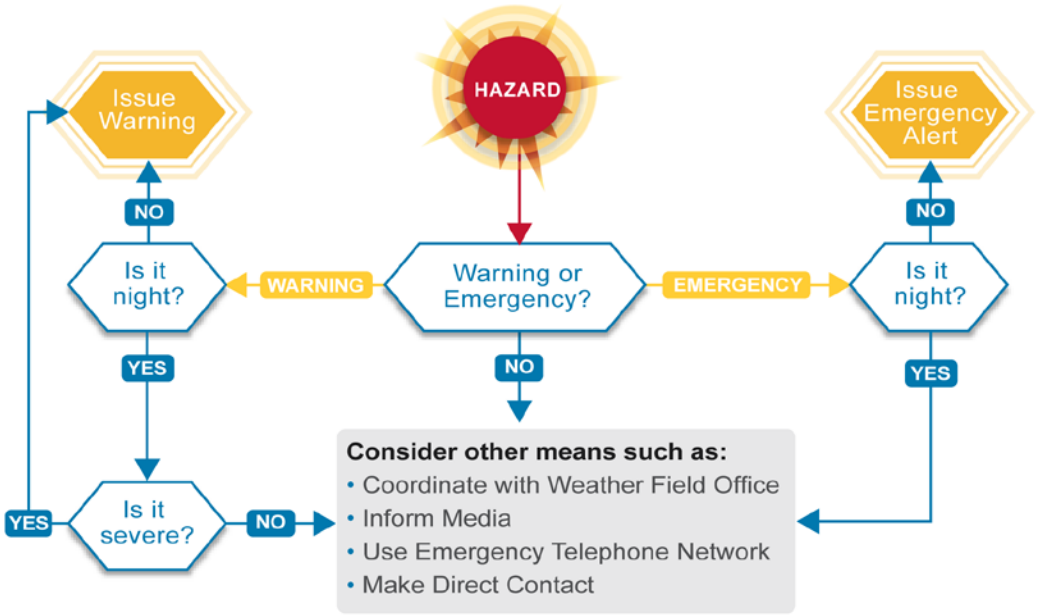
EAS (broadcasters) and NWEM (weather radio) alerts can provide more information. For example, the "Headline" element of a NWEM message may be 160 characters and the "Description + Instruction" elements may be up to 160 words total. WEA messages are limited to 90 characters of text only. The WEA message content can be entirely composed by the Alerting Authority (using the "CMAMText" element) or may be automatically generated from values in the Common Alerting Protocol (CAP) description, instruction, area description, and alert begin and end time elements as provided in the Alerting Authority's CAP message.

Criteria for Issuing IPAWS Messages

When circumstances exist where the need for a public warning becomes necessary, it will ultimately be a matter of local judgment. To assist in the decision-making process, the following criteria can be applied:

- Does the hazardous situation require the public to take immediate action?
- Does the hazardous situation pose a serious threat to life or property?
- Is there a high degree of probability the hazardous situation will occur?
- Are other means of disseminating the information adequate to ensure rapid delivery of urgent information?

The figure below illustrates a decision tree to aid in the decision-making process.



Warnings for only the most imminent and hazardous events should be issued during late night hours. The EAS may not be effective for delivering late night warnings via radio and television broadcast; therefore, additional, best available channels should be considered.

Types of IPAWS Messages

There are two types of alert messages for which emergency management will use IPAWS: warnings and emergencies.

- **Warning messages**: Warning messages are issued for those events that alone pose a significant threat to public safety and/or property, probability of occurrence and location is high, and the onset time is relatively short.
- **Emergency messages**: Emergency messages are issued for those events that by themselves would not kill or injure or do property damage but indirectly may cause other things to happen that result in a hazard.

Training Requirements

Prior to initial access and posting alerts, training requirements for IPAWS are as follows:

- Computer security awareness training prior to initial access and annually thereafter, either a locally delivered course or, if not available locally, Domestic Preparedness Campus online course, CYBER 175-W (175-W) — Information Security for Everyone (https://teex.org/Pages/Class.aspx?course=AWR175&courseTitle=Information%20Security%20for%20Everyone)[33]
- IS-247.a course for COG point of contact (POC) and any user with Alerting Authority for IPAWS public alerts (http://www.training.fema.gov/is/courseoverview.aspx?code=IS-247.a)[34]
    - The COG POC must complete IS-247.a and submit a copy of his or her training certificate as part of the application process. All other training records are maintained locally.

Software for Sending Alerts

A list of system developers, available from the FEMA website, indicate which vendors have completed development or are developing alerting tools for use with IPAWS. (http://www.fema.gov/media-library/assets/documents/25916)[35]

Activating Alerts

The four free-text fields of an alert (Headline, Description, Instructions, and CMAMtext [cell phone message]) must be reviewed before posting. Rushed alerts with poor wording can have disastrous effects. Messages should be pre-scripted as much as possible prior to an event.

Effective Alert and Warning Messages

How an alert or warning message is written is as important as what is written. Poorly written warnings can undermine both understanding and credibility. “Style” refers to how

[33] Accessed online January 24, 2019.
[34] Accessed online January 24, 2019.
[35] Accessed online January 24, 2019.

you write. Considerations when writing accessible and usable alert and warning messages should include the following:

- **The message must be *specific***: If the message is not specific enough about the who, what, when, where, why, and how of an incident, the public will spend more time seeking specific information to confirm the risk than responding to the message. If necessary, be specific about what is or is not known about the hazard.
- **The message must be *consistent***: An alert or warning message should be internally consistent; that is, one part of the message should not contradict another part. It should be consistent with messages that are distributed through other channels. To the extent possible, alerts and/or warnings should be consistent from event to event to the degree that the hazard is similar.
- **The message must be *certain***: Avoid conveying a sense of uncertainty, either in content or in tone. Confine the message to what is known or, if necessary, describe what is unknown in certain terms. Do not guess or speculate.
- **The message must be *clear***: Use common words that can easily be understood. Do not use technical terminology or jargon. If protective instructions are precautionary, state so clearly. Make it clear if protective instructions pertain to particular at-risk populations (e.g., elderly). If the probability of occurrence of the hazard event is less than 100 percent, try to convey in simple terms what the likelihood of occurrence is.
- **The message must be *accurate***: Do not overstate or understate the facts. Do not omit important information. Convey respect for the intelligence and judgment of the public.

To this end, only those individuals who have successfully completed the IS-247.a course and have been officially designated by their jurisdiction as an Alerting Authority will be provided access to the system. FEMA will approve the State-designated POC. This POC will then be responsible for verifying and certifying applicable State agency, local jurisdiction, and tribal government Alerting Authorities within the State.

System Security

To ensure joint security of the systems and the message data they store, process, and transmit, all parties participating in IPAWS agree to the following:

- Authorized users accessing the interoperable system(s) receive, agree to abide by, and sign (electronically or in paper form) IPAWS-Open Platform for Emergency Networks (IPAWS-OPEN) Rules of Behavior. Each jurisdiction is responsible for keeping the signed Rules of Behavior on file or stored electronically for each system user.
- FEMA-approved public key infrastructure (PKI) certificates must be used to digitally sign messages as they are transported over the public Internet.
- Each jurisdiction must certify that its respective system is designed, managed, and operated in compliance with all relevant Federal laws, regulations, and policies.

- Each jurisdiction must document and maintain jurisdictional and/or system-specific security policies and procedures and produce such documentation in response to official inquiries and/or requests.
- Each jurisdiction must provide physical security and system environmental safeguards for devices supporting system interoperability with IPAWS.
- Where applicable, only individuals who have successfully completed FEMA–required training can use the interoperable systems to issue alerts and warnings intended for distribution to the public.
- Where applicable, records of successful completion of FEMA–required training must be documented and maintained, and such documentation must be produced in response to official inquiries and/or requests.
- All email addresses provided in connection with interoperable system(s) user accounts are associated to an approved email account assigned by the user's emergency management organization. The use of personal email accounts to support emergency messaging through IPAWS is prohibited.
- Upon approval of the MOA by FEMA, a COG account with a COG identification (ID) number and digital certificate will be created and issued to the designated technical representative. All individuals with knowledge of these credentials must not share or alter these authentication mechanisms without explicit approval from IPAWS.
- Physical and logical access to the respective systems, as well as knowledge of the COG ID and associated access criteria, are only granted to properly vetted and approved entities or individuals.
- Every interoperable system user is responsible for remote access security as it relates to his or her use of IPAWS and shall abide by the Rules of Behavior per COG MOA.
- All users must have a discrete user account ID, which cannot be the user's social security number. To protect against unauthorized access, passwords linked to the user ID are used to identify and authenticate authorized users.
- Accounts and passwords shall not be transferred or shared. The sharing of both a user ID and associated password with anyone (including administrators) is prohibited.
- Accounts and passwords shall be protected from disclosure, and writing passwords down or electronically storing them on a medium that is accessible by others is prohibited.
- The selection of passwords must be complex and be at least eight characters in length, include at least two uppercase and two lowercase letters, and include at least two numbers and one special character.
- Passwords must not contain names, repetitive patterns, dictionary words, product names, or personal identifying information (e.g., birthdate, social security number, phone number) and must not be the same as the user ID.
- Users are required to change their passwords at least once every 90 days.

- Passwords must be promptly changed whenever compromise of a password is known or suspected.
- All computer workstations accessing IPAWS must be protected by up-to-date antivirus software. Virus scans must be performed on a periodic basis and when notified by the antivirus software.
- Users accessing interoperable systems to use IPAWS must:
  - Physically protect computing devices such as laptops, personal electronic devices, BlackBerry® devices, smart phones, etc.;
  - Protect sensitive data sent to or received from IPAWS;
  - Not use peer-to-peer (P2P) file sharing, which can provide a mechanism for spreading viruses and put sensitive information at risk; and
  - Not program computing devices with automatic sign-on sequences, passwords or access credentials when using IPAWS.
- Users may not provide personal or official IPAWS information solicited by email. If email messages are received from any source requesting personal information or asking to verify accounts or other authentication credentials, users must immediately report this and provide the questionable email to the local System Administrator and/or the State POC.
- Only devices officially issued through or approved by the U.S. Department of Homeland Security (DHS), FEMA, and/or approved emergency management organizations are authorized for use with IPAWS.
- If a BlackBerry®, smart phone, or other personal electronic device is used to access the interoperable system(s) to use IPAWS, the device should be password-protected and configured to timeout or lock after 10 minutes of inactivity.
- If sensitive information is processed, stored, or transmitted on wireless devices, it must be encrypted using approved encryption methods.

System Tests

At the local, county, and State level, quarterly tests or exercises of IPAWS will be conducted to ensure the ability to send emergency notification information across the entire network. Any impediments will be immediately identified and a resolution at the lowest jurisdictional level possible will be ascertained.

It is anticipated that the FEMA IPAWS Program Management Office (PMO) will conduct tabletop, scenario-based, and full-scale exercises of the public alert and warning communication systems. Where applicable, all jurisdictions will be encouraged to participate in these exercises. Additionally, the State and/or local jurisdictions may find it necessary to conduct IPAWS–only exercises to test the connectivity of the network. Though these exercises may involve a small portion of the response community, they do need to be reflected on the State's regionally defined Training and Exercise Planning Workshop (TEPW) calendars. If an IPAWS component is to be part of a larger exercise, then it does not need to be included on a TEPW calendar.

Coordination

Local Media

Local media has a desire to keep their audiences informed of ongoing events. Besides their broadcasts, many have developed instant messaging systems to keep the public informed of key events through a variety of social media networks. Coordination with local media outlets is one of the linchpins for successfully communicating alerts to the public through IPAWS. Making use of media's desire to inform its audience, jurisdictions have established and continue to build relationships with the media for the passage of critical, time-sensitive information.

The challenge is that many media outlets are market-driven and are not constrained by political boundaries. In many cases, a television or radio broadcast station that covers multiple counties and/or localities or State-defined regions may be physically located in a neighboring State.

Public

Public outreach will primarily be in two forms. First, through multiple venues, such as newspaper articles, public service announcements, town hall meetings, or other activities that the jurisdiction has found effective, the general public will be encouraged to continue to listen to and follow officials' guidance as to what to do when a disaster occurs.

Second, periodically (especially after an incident occurs) the public should be canvassed as to the clarity and effectiveness of the messages that were broadcast. The responses should be reviewed to determine if any changes to the message content need to take place. The results should also be passed to the applicable State agency to share for the benefit of other jurisdictions.

Roles and Responsibilities

Federal

FEMA is the lead Federal agency for IPAWS coordination and implementation. FEMA ensures that the system is functional, maintained, and tested to achieve the following:

- Build and maintain an effective, reliable, integrated, flexible, and comprehensive alert and warning system.
- Enable Federal, State, Territorial, Tribal, and local alert and warning emergency communication officials to access multiple broadcast and other communications pathways for the purpose of creating and activating alert and warning messages related to hazards impacting public safety and well-being.
- Reach the American public before, during, and after a disaster through as many means as possible.
- Diversify and modernize the EAS.
- Create an interoperability framework by establishing or adopting standards such as CAP.

- Enable alert and warning to those with disabilities and others with access and functional needs and to those without an understanding of the English language.
- Partner with NOAA to enable seamless integration of message transmission through national networks.
- Receive and authenticate alert messages, then simultaneously deliver to all IPAWS–compliant public alerting systems.
- Continue to engage the media, Internet service providers, unique and local alerting system providers, and future alert technology developers on the implementation of IPAWS.
- Authenticate State-level Alerting Authorities.
- Allow the President of the United States to speak to the American people under all emergency circumstances, including situations of war, terrorist attack, natural disaster, or hazards.
- Ensure required Emergency Management Institute (EMI) courses are available and updated periodically.

State

Recognizing that all disasters are local, the primary responsibility of the State will be to facilitate implementation of IPAWS into the emergency notification network. In the case of a catastrophic local, State, or regionally defined event, the State will use IPAWS to provide a resilient and comprehensive alert and notification capability.

- The [State] Office of Emergency Management (OEM) will be designated the COG as per the signed MOA with FEMA.
- _____ shall be the alternate State agency to provide statewide IPAWS warnings and alerts.
- OEM will form a working group comprising applicable statewide stakeholders. This working group will bring together the necessary technical and operational expertise from the private sector, nonprofit organizations, local jurisdictions, State agencies, and the Federal government with the goal of defining policy and procedures leading to the implementation of IPAWS across the State. The working group shall include representatives from the following agencies:
  - OEM
  - [State] Broadcasters Association
  - NWS
  - A representative from the Commercial Mobile Radio Service (CMRS) Emergency Telecommunications Board
  - Representatives from local emergency management agencies (EMAs)
  - A representative from the State Emergency Response Commission

- OEM will be the authentication source for all local and State-agency alerting authorities.
- OEM will track approved COGs.
- OEM will be the approving agent for local jurisdictional requests and/or plans to incorporate locally contracted providers into the IPAWS network.
- OEM will conduct periodic tests of the system to ensure functionality of equipment and the network.
- OEM will provide a backup capability for local jurisdictions' alerting authorities to issue emergency broadcasts in the name of the local jurisdiction.

Local Jurisdictions

Except in rare occurrences such as the events of September 11, 2001, most disasters and emergencies are locally oriented. While first responders prepare to respond to the initial aftereffects of an incident, it is an inherent responsibility of local officials to keep the public informed of what actions the public needs to take to protect themselves from the consequences of the incident. These could include evacuation orders, location of points of distribution (for food, water, drugs, etc.), instructions to move to higher ground, shelter-in-place guidance, and orders to take cover. Passing these instructions to the public is the primary purpose of IPAWS. Because local officials have a better understanding of the situation, the immediate actions that are being taken, and potential adverse impacts of the incident, it is incumbent upon these officials to rapidly and effectively communicate to the public what is going on and what needs to be done.

To successfully accomplish this task, local jurisdictions need to have a structure in place to provide for this rapid alert and warning. Many of the tasks leading to this structure will include the following:

- Submit to the State a request and/or plan that identify emergency notification providers/systems for inclusion into the IPAWS network.
- Designate in writing, in accordance with jurisdictional procedures, no fewer than three individuals who will be the jurisdiction's alerting authorities for issuing emergency broadcasts with IPAWS following their successful completion of the IS–247.a course. Typically, this would be the jurisdiction's emergency manager and staff.
- Incorporate IPAWS into existing and future response plans and procedures as well as training and exercise events.
- Conduct periodic tests of the system to ensure functionality of equipment and the network.

COGs will maintain a database of all individuals who have successfully completed the IS-247.a course and other required courses as directed by Federal guidance. This database will contain copies of completed course certificates; individual names, addresses, and contact information; and copies of memorandums and/or resolutions officially

designating these individuals as alerting authorities. A copy of each jurisdiction's signed Rules of Behavior will also be included.

COG–level permissions must be obtained from NWS to submit NWEMs via NOAA weather radio.

Immediately after broadcast, a copy of the alert must be sent (COG-to-COG, faxed, or emailed) to the State OEM, and the County Judge/Executive or Mayor (statutory authority) must be notified.

Plan Maintenance

This Plan shall be maintained and kept current by all parties on the following schedule:

- Updates can occur at any time based upon the change of Federal guidance.
- A cursory review of the Plan will be performed on an annual basis. Changes will be annotated on the Record of Change sheet.
- A complete review and update of the Plan will occur every 4 years at a minimum. This review will consist of all partners having the opportunity to comment on all elements of the Plan.

Review and revision of procedures will follow critiques of actual emergency or disaster operations and/or exercises where deficiencies were noted.

Acronyms

CAP	Common Alerting Protocol
CMAS	Commercial Mobile Alert System
COG	Collaborative Operating Group
CMRS	Commercial Mobile Radio Service
EAS	Emergency Alert System
EMI	Emergency Management Institute
EOC	Emergency Operations Center
FEMA	Federal Emergency Management Agency
FIPS	Federal Information Processing Standard
ICS	Incident Command System
IPAWS	Integrated Public Alert and Warning System
OEM	Office of Emergency Management
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NOAA	National Oceanic and Atmospheric Administration
NWEM	Non-Weather Emergency Message
NWS	National Weather Service
OPEN	Open Platform for Emergency Networks
PKI	Public Key Infrastructure
POC	Point of Contact
TEPW	Training and Exercise Planning Workshop

Glossary

Agency Representative: This term refers to a person assigned by a primary, assisting, or cooperating Federal, State, local, or tribal government agency or private entity that has been delegated authority to make decisions affecting that agency's or organization's participation in incident management activities following appropriate consultation with the leadership of that agency.

Agency: This term refers to a division of government with a specific function offering a particular kind of assistance. In the Incident Command System (ICS), agencies are defined either as jurisdictional (having statutory responsibility for incident management) or as assisting or cooperating (providing resources or other assistance).

Alerting Authority: This term refers to a designated jurisdictional individual who is authorized to write an alert or warning for distribution using open standards and to release the alert or warning.

Collaborative Operating Group: IPAWS is structured around COGs. A COG is a virtual organization that holds membership in IPAWS and manages system access within that organization. When the application process is complete, FEMA will assign each agency a COG ID number and digital certificate.

Disaster (State Definition): This term refers to the *occurrence or imminent threat of widespread or severe damage, injury, or loss of life or property, or significant adverse impact on the environment, resulting from any natural or technological hazards, or a terrorist act,* including fire, flood, earthquake, wind, storm, hazardous substance incident, water contamination requiring emergency action to avert danger or damage, epidemic, air contamination, blight, drought, infestation, explosion, civil disturbance, and hostile military or paramilitary action. For the purpose of State or Federal disaster declarations, the term "disaster" generally falls into one of two categories relative to the level of severity and impact on local and State resources: major (i.e., likely to require immediate State assistance supplemented by limited Federal resources, if necessary, to supplement intra-state efforts and resources) and catastrophic (i.e., requiring immediate and massive State and Federal assistance in both the response and recovery aspects). Local government's adaptation of the definition of a disaster denotes an event that threatens to or actually inflicts damage to people or property and is or is likely to be beyond the capability of services, personnel, equipment, and facilities of a local jurisdiction, thereby requiring augmentation of resources through State-directed assistance.

Emergency (State Definition): This term refers to a *suddenly occurring and often unforeseen situation* that is determined by the Governor to require State response or mitigation actions to immediately supplement local government in protecting lives and property, to provide for public health and safety, or to avert or lessen the threat of a disaster. Local government's adaptation of this definition connotes an event that threatens to or actually inflicts damage to people or property, exceeds the daily routine type of response, and still can be dealt with using local internal and mutual aid resources.

Integrated Public Alert and Warning System (IPAWS): In the event of a national emergency, the President will be able to use IPAWS to send a message to the American people quickly and simultaneously through multiple communications pathways. IPAWS is also being made available to Federal, State, Territorial, Tribal, and local government officials to alert the public via EAS, WEA, NOAA Weather Radio and other NWS dissemination channels, the Internet, existing unique warning systems, and emerging distribution technologies.

Jurisdiction: This term refers to a range or sphere of authority. Public agencies have jurisdiction at an incident related to their legal responsibilities and authority for incident mitigation. Jurisdictional authority at an incident can be political or geographical (e.g., city, county, State, or Federal boundary lines) or functional (e.g., police department, health department).

Memorandum of Agreement (MOA): This term refers to an agreement document between two or more agencies proscribing reciprocal assistance to be provided upon request (and if available from the supplying agency) and laying out guidelines under which this assistance will operate.

Memorandum of Understanding (MOU): This term refers to a non-reimbursable agreement between two or more agencies.

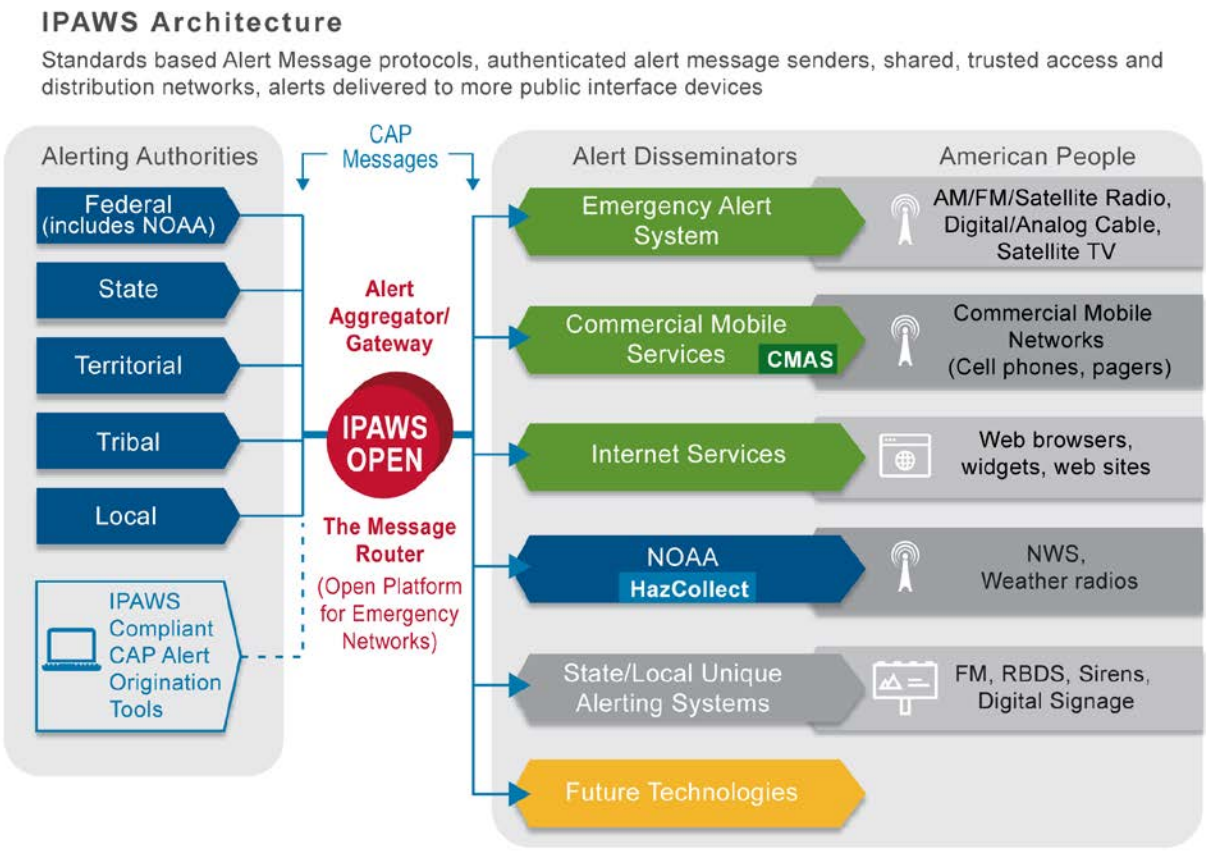
Mutual-Aid Agreement: This term refers to a written agreement between agencies and/or jurisdictions indicating that they will assist one another on request by furnishing personnel, equipment, and/or expertise in a specified manner.

National Weather Services: NWS is the Federal government agency charged with weather-related reporting and projections.

Shelter in place: This term refers to a course of action to take immediate shelter where you are—at home, work, school, or wherever you can take protective shelter. It may also mean "seal the room," i.e., take steps to prevent outside air from coming in.

State: When capitalized, this refers to any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and any possession of the United States. See Section 2 (14), Homeland Security Act of 2002, Pub. L. 107-296, 116 Stat. 2135 (2002).

Appendix A: IPAWS Architecture and Alert Elements



Alert Elements

Event Codes that will pass all three dissemination channels (EAS, CMAS, and Internet Services) are listed below:

CDW	Civil Danger Warning
CEM	Civil Emergency Message
EQW	Earthquake Warning
EVI	Evacuate Immediate
FRW	Fire Warning
HMW	Hazardous Materials Warning
LAE	Local Area Emergency
LEW	Law Enforcement Warning
RNW	Radiological Hazard Warning
SPW	Shelter in Place Warning

Additional Event Codes that may be needed but will not pass to all three dissemination channels are as follows:

TOE	9-1-1 Telephone Outage Emergency (will not go to WEA)
RMT	Required Monthly Test (will not go to NWEM or WEA)
RWT	Required Weekly Test (will not go to WEA)

CAP Data Info Elements Special Note for Generating WEA:

The following CAP Info Elements for Urgency Severity and Certainty must each be set to one of the two highest levels to indicate that the alert is an "Imminent Threat," which then enables the alert to be sent as a WEA. The values are set by the Alerting Authority generating the message based upon his or her analysis of the threat at the time that the message is being written:

- **Urgency**: Available values for WEA "imminent threat" alert are as follows:
  - "Immediate": Responsive action should be taken immediately
  - "Expected": Responsive action should be taken soon (i.e., within the next hour)

  Other available Urgency values that do not qualify a message for WEA are as follows:
  - "Future": Responsive action should be taken in the near future
  - "Past": Responsive action is no longer required
  - "Unknown": Urgency not known
- **Severity**: Available values for WEA "imminent threat" alert are as follows:
  - "Extreme": Extraordinary threat to life or property
  - "Severe": Significant threat to life or property

  Other available values' Severity that do not qualify a message for WEA are as follows:
  - "Moderate": Possible threat to life or property
  - "Minor": Minimal to no known threat to life or property
  - "Unknown": Severity unknown
- **Certainty**: Available values for WEA "imminent threat" alert are as follows:
  - "Observed": Determined to have occurred or to be ongoing
  - "Likely": Probability is greater than or equal to 50 percent

  Other available values' Certainty that do not qualify a message for WEA are as follows:
  - "Possible": Possible but not likely (p <= ~50 percent)
  - "Unlikely": Not expected to occur (p ~ 0)

- "Unknown": Certainty unknown

Event Category

Event categories include the following:

Geo	Geophysical (including landslides)
Met	Meteorological (including floods)
Safety	General emergency and public safety
Security	Law enforcement, military, homeland and local/private security
Rescue	Rescue and recovery
Fire	Fire suppression and rescue
Health	Medical and public health
Env	Pollution and other environmental concerns
Transport	Public and private transportation
Infra	Utility, telecommunication, other non-transport infrastructure
CBRNE	Chemical, biological, radiological, nuclear or high-yield explosive threat or attack
Other	Other events

- **Expires**: A required element for all alerts
- **Headline**: A brief headline less than 140 characters (not used by WEA or EAS, but used by NWEM)
- **Description**: A text description of the hazard or event (not used by WEA, but used by EAS and NWEM)
- **Instruction**: The recommended action to be taken by recipients of the alert message. (not used by WEA, but used for EAS and NWEM)

For NWEM alerts, descriptions, and instructions, must not exceed 160 words. For EAS alerts, FCC–required text and description and instruction combined must not exceed 1,800 characters (where FCC–required text is automatically generated by the broadcaster's EAS device).

Response Type

Response type elements used by WEA are as follows:

- **Shelter**: take shelter in place or per instruction
- **Evacuate**: relocate per the instruction
- **Prepare**: make preparations per the instruction
- **Execute**: execute a pre-planned activity identified in instruction
- **Avoid**: avoid the subject event as per the instruction
- **Monitor**: attend to information sources as described in instruction

Parameters

Parameters are not identified in IS-247 training but are required by IPAWS applications.

EAS-ORG CIV

- **Timezone**: depends upon location (Eastern, Central, or Mountain time zones)
- **CMAMtext**: 90-character message used by CMAS that appears on cell phones
  - Very important
  - Use maximum length possible to best describe the alert.

Area Description

Text description of affected area. Used by EAS and NWEM.

Geocode

An alert will most likely be countywide. The 6-digit FIPS code for the county will be used. NWEM messages will all be countywide. Some alerting software allows a map polygon or circle to define the alerting area. An alert message will not be limited to the area of an alert, particularly a small one; there will be coverage overlap by cell towers beyond the defined area.

Resource

The optional resource element and related sub-elements offer the ability to incorporate multimedia such as images, audio, and video as attachments.

Appendix B: (State) Emergency Alert System Plan

Insert copy of the State Emergency Alert System Plan.

Appendix C: Alert and Notification Capabilities

WXXX – AM Radio 570
Broadcast Area: Model City
24/7 Contact Number: (555) 555-1234

WYYY – AM Radio 1460
Broadcast Area: Model County
24/7 Contact Number: (555) 555-1234

WZZZ – FM Radio 102.1
Broadcast Area: Model City
24/7 Contact Number: (555) 555-1234

WXYZ – Television Channel 2
Broadcast Area: Model City
24/7 Contact Number: (555) 555-1234

ABC Wireless
24/7 Contact Number: (555) 555-1234
Model County Cable
24/7 Contact Number: (555) 555-1234

Appendix D: Use of IPAWS for Pre-planned Events

Purpose

This appendix provides guidelines for the use of IPAWS and distribution media for alerting the public to events that may pose a risk to the public due to pre-planned events.

The use of IPAWS during a pre-planned event may be a viable method to alert the public of the event and mitigate panic and risk to the public and participants. These messages would advise the public of the event and that there is no cause for alarm or warn the public of any risks. This guideline does not supplant the authority of the individual jurisdiction's elected officials and emergency management staff. Any alert must still be approved by the alerting authority for the jurisdiction before being sent.

Planning

During the planning of a pre-planned event (exercise or public event), the risks associated with the event should be identified. If the planned event has a potential risk to the public or public safety, the use of IPAWS to mitigate that risk may be appropriate.

Examples of events and risks:

- Controlled burn of large area
  - Risks: Smoke on roadway impairing driving, medical conditions of people in area
- Planned power outage
  - Risks: Health and media conditions, traffic accidents
- School active shooter exercise
  - Risks: Panic of the general public in the area, Good Samaritan reactions putting the players at risk
- Major bicycle road race
  - Risks: Traffic accidents, injury to riders and bystanders

During the planning for each event, the alerting authority should review the event and identify risks. These risks should be reviewed against permitted uses and target audiences of the various IPAWS dissemination media. The alerting authority will determine if the use of IPAWS is appropriate. Guidelines for use of IPAWS should be defined and documented in the event plan or an appendix.

Authorized Use

IPAWS has several dissemination media, listed below. Each system has a different audience and rules for use.

Dissemination System	Audience	Rules	Notes
Emergency Alerting System (EAS)	Broadcast radio and television viewers (not internet or satellite)	47 CFR 11 State EAS Plan	Broadcasters are not required to re-transmit alerts from local authorities. An EAS alert will be delivered to a large audience.
Wireless Emergency Alerts (WEA)	Wireless phones in the area of the alert	47 CFR 10	WEA has specific criteria for use. See * below.
Non-Weather Emergency Messages (NWEM)	Weather radio users	NWS policies	NWEM alerts will be sent to a National Weather Service transmitter that covers a large area. The alert may also be rebroadcast by broadcast radio and television as an EAS message, but the entities are not required to carry.
IPAWS All-Hazards Information Feed	Third-party software and service providers; usually a subscription type service	IPAWS rules	Currently, defining specific criteria for delivery due to the many varied systems using this data is unclear.
Collaborative Operating Group (COG) to COG	Other specific COGs	IPAWS rules	Used to coordinate and share information between COGs.

For an alert to be sent to the WEA system, the event must meet the following criteria in accordance with 47 CFR 10.400:

- **Urgency**. The CAP Urgency element must be either *Immediate* (i.e., responsive action should be taken immediately) or *Expected* (i.e., responsive action should be taken soon, within the next hour).
- **Severity**. The CAP Severity element must be either *Extreme* (i.e., an extraordinary threat to life or property) or *Severe* (i.e., a significant threat to life or property).
- **Certainty**. The CAP Certainty element must be either *Observed* (i.e., determined to have occurred or to be ongoing) or *Likely* (i.e., has a probability of greater than 50 percent).

Message Format and Content

When using IPAWS for a pre-planned event, the alerting authority has the ability to write alert messages in advance to properly communicate the message. Various expected messages should be developed using message templates to use or have available in the event they are needed.

The alerting authority must be identified in all alert messages.

Each audience, message, and distribution media should be reviewed. Is the audience smaller than the distribution media will reach? Will the message cause more concern to the public than the event? Below are some general guidelines for using the available distribution media.

- It is not recommended that the alerting authority use WEA messages unless the alerting authority has the ability to include and edit the free-form 90-character <CMAMText> element into the CAP message.
- The WEA message will also allow the alerting authority to make effective use of the <expires> element to keep alerts active for the time of the event. WEA messages, unlike EAS, will be broadcast to phones as they enter the selected area of the alert until the <expire> time.
- EAS alerts will be distributed to the broadcast audience, which is often larger than the intended audience. For an event that is small and limited to a specific area, EAS may not be the best distribution media. Understanding how your local broadcast stations are configured is important in selecting the proper distribution media.
- NWEM is also sent to a transmitter that has a large coverage area. The users can use Specific Area Message Encoding (SAME) technology to limit this area, but this will still alert an entire county. In some cases, local broadcast media will monitor the NWEM feed and rebroadcast alerts as an EAS message.
- When determining the event code to use, the following definitions of some common codes from the NWS Instruction 10-518 *Non-Weather Emergency Products Specifications* are provided to assist in compiling the alert message.
    - **Civil Danger Warning (CDW)**: This is a warning of an event that presents a danger to a significant civilian population. CDW, which usually warns of a specific hazard and gives specific protective action, has a higher priority than Local Area Emergency (LAE). Examples include contaminated water supply and imminent or in-progress military or terrorist attack. Public protective actions could include evacuation, shelter in place, or other actions (such as boiling contaminated water or seeking medical treatment).
    - **Civil Emergency Message (CEM)**: This is an emergency message regarding an in-progress or imminent significant threat(s) to public safety and/or property. CEM is a higher priority message than LAE, but the hazard is less specific than the Civil Danger Warning (CDW).
    - **Local Area Emergency (LAE)**: This is an emergency message that defines an event that, by itself, does not pose a significant threat to public safety and/or property. However, the event could escalate, contribute to other more serious events, or disrupt critical public safety services. Instructions, other than public protective actions, may be provided by authorized officials. Examples include a disruption in water, electric, or natural gas service; or a potential terrorist threat where the public is asked to remain alert.
    - **Law Enforcement Warning (LEW)**: This is a warning of a bomb explosion, riot, or other criminal event (e.g., a jailbreak). An authorized law enforcement agency may blockade roads, waterways, or facilities; evacuate or deny access to affected areas; and/or arrest violators or suspicious persons.[36]

[36] National Weather Service, Operations and Services; Public Weather Services, NWSPD 10-5, *Non-Weather Emergency Products Specification* (Instruction 10-518, July 28, 2010)

Procedures

When using IPAWS for a pre-planned event, the following procedures should be followed:

1. Determine the need.
    a. Determine the event and expected outcomes.
    b. Determine the risks involved.
    c. Determine the benefit that IPAWS can bring to mitigating these risks.
2. Determine whether the use of IPAWS is a benefit and is permitted. (Alerting Authority determines that the use is appropriate given the risk and benefits.)
    a. Incorporate IPAWS into the planning process.
    b. Develop message templates.
3. Coordinate with other jurisdictions and public and private partners.
    a. Notify surrounding jurisdictions of the plan.
    b. Notify the State of the plan.
4. Execute the plan.
    a. Follow the plan for the use of IPAWS.
    b. Notify surrounding jurisdictions when it is activated.
    c. Notify the State when it is activated.
    d. Notify all parties of any changes in the plan.
    e. Notify all parties when event is completed.

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Appendix I: Model Memorandum of Understanding Template

The MOU Template can be found on the following pages and as an attached Word file.

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Model Memorandum of Understanding for Emergency Alerting to the Public

Introduction

The jurisdictions of [insert counties or jurisdiction names here] recognize the need for interagency cooperation to enhance public-alerting capabilities. This memorandum of understanding (MOU) allows the jurisdictions to improve their ability to warn the public of emergencies in a timely manner where a multi-jurisdictional impact is likely.

Purpose

This MOU will allow emergency notifications to reach those affected by an incident and help to eliminate duplicate or conflicting instructions. Each jurisdiction participating in this MOU can activate the Integrated Public Alert and Warning System (IPAWS) in an emergency.

Scope

This MOU is effective as of [Month Day, Year] and will continue until revoked by all parties following the procedures listed in Section 7—Changes to MOU. The MOU may be used when there is an incident other than a weather event that has occurred in a jurisdiction that may impact an area outside of the incident jurisdiction and the incident may impact the outside jurisdiction within 30 minutes.

Parties to the MOU are:

Jurisdiction:
Point of Contact:
Address:
City, State Zip:
Email:
Office phone:
24 x 7 phone:
Event Codes Allowed:
FIPS Code:

Jurisdiction:
Point of Contact:
Address:
City, State Zip:
Email:
Office phone:
24 x 7 phone:
Event Codes Allowed:
FIPS Code:

Acronyms and Definitions

- FEMA: Federal Emergency Management Agency
- IPAWS: Integrated Public Alert and Warning System
- Memorandum of Understanding (MOU): an agreement between two or more parties for the purpose of formalizing an agreed-upon process or procedure

Policy

All parties agree that, in the event of an emergency incident that meets the criteria below, the jurisdiction where the emergency originated can initiate an alert for any participating jurisdiction to this MOU.

Incident Criteria:

- The event is not a weather emergency. (The National Weather Service will lead these incidents.)
- The incident will have an impact on people outside of the incident jurisdiction within 30 minutes of the onset.
- The incident's impact to people outside of the jurisdiction may be endangered if action is not taken by the public (such as evacuation or shelter in place),
- Jurisdiction A may alert for limited areas of the following jurisdictions:
  - Jurisdiction B (FIPS 12345)
  - Jurisdiction C (FIPS 23456)
- Jurisdiction B may alert for limited areas of the following jurisdictions:
  - Jurisdiction A (FIPS 34567)
  - Jurisdiction C (FIPS 23456)
- A message is limited to the following event codes:
  - CDW—Civil Danger Warning
  - EVI—Evacuate Immediate
  - FRW—Fire Warning
  - HMW—Hazardous Materials Warning
  - SPW—Shelter in Place

Alerts to other jurisdictions will be limited to the geographic area affected, not an entire county or FIPS code.

Procedures

The originating jurisdiction will use the following procedures:

1. Identify an incident that may impact neighboring jurisdictions.

2. Determine if that impact meets the policy of this MOU.
3. Compose an IPAWS message that includes the other affected jurisdictions' geographic area.
4. Send the IPAWS message.
5. Contact affected jurisdictions to provide detailed information on the incident.
6. Coordinate further alerts with all affected jurisdictions.

The affected jurisdiction will use the following procedures:

1. Monitor IPAWS feeds for all incidents or messages for the jurisdiction.
2. Coordinate with originating jurisdiction for any ongoing alerts or follow up messages.

Changes to MOU

This MOU will be reviewed and reaccepted each year in January. The originating jurisdiction will send notification to each party to the MOU that the MOU has been reviewed and notification of changes requested.

If changes are requested to this MOU, the requesting jurisdiction will submit the requested changes to all other parties. Each party will review and provide acceptance, modification, or rejection to the originating jurisdiction. If all parties agree to the change(s), the originating jurisdiction will prepare a new version of the MOU for signature by all parties.

If a jurisdiction elects to revoke the MOU, the jurisdiction will notify all other parties of the MOU in writing with a 30-day notice. Each other party will notify its intent to remain a party to the MOU. Remaining parties can continue the MOU in areas that do not pertain to the jurisdiction that has left the MOU. The jurisdiction wishing to revoke the MOU will prepare a new version without their jurisdiction's participation for signature by the other parties. The MOU is fully revoked when there is only one or no party remaining.

The State needs to be notified of any changes to the MOU, including changes of participants. A completed copy of the MOU will be forwarded to the State and to the FEMA IPAWS Program Management Office.

Appendix J: Model Procedures

The Model Procedures can be found on the following pages, and as an attached Word file.

Additional example procedures can be located at the following websites:

IPAWS Plan Template
https://www.fema.gov/media-library-data/1409762245649-42bb64d7495d561cf3892b98c68186ea/TEMPLATE_Emergency%20Communications%20Plans%20and%20IPAWS_508.pdf (accessed January 23, 2019)

Florida Atlantic University Emergency Notification and Alerting Policies and Procedures
https://www.fau.edu/facilities/ehs/policies-and-procedures/EHS23-ENAPP-web.pdf (accessed January 23, 2019)

City of Santa Monica Alerts Policy and Procedures
https://www.smgov.net/departments/oem/sems/alerting-and-warning/sm-alerts-policy-and-procedures.pdf (accessed January 23, 2019)

University of South Carolina Policy
http://carolinaalert.sc.edu/wp-content/uploads/2015/08/EM-1.00-Emergency-Notification-System-Policy.pdf (accessed January 23, 2019)

Michigan State Police Information Bulletin
http://www.michigan.gov/documents/msp/IPAWS_Informational_Letter_2-4-13_410325_7.pdf (accessed January 23, 2019)

Town of Carlisle (Massachusetts) Policy for Activating Emergency Notification System
https://www.carlislema.gov/DocumentCenter/View/55/Emergency-Notification-System-Activation-Policy-PDF (accessed January 23, 2019)

The Homeland Security Digital Library (HSDL)
This site includes information available to the general public as well as a secure section for public safety.
http://www.hsdl.org/ (accessed January 23, 2019)

LOGO

Central County
Standardized Operational Guidelines

Page X of X
Number: 101
Subject: Alerting Authority Guidelines Effective Date: 01-01-2013
Approved By: _____Version #: 2 Version Date: 01-01-2014

Purpose

Alert authority guidelines define the people and positions with the authority to issue an alert to the public using the alerting systems of Central County.

Scope

This guideline applies to staff and volunteers of Central County and all subordinate political jurisdictions for the use of Central County public alerting systems.

Guidelines

Statutory authority
State statute XX.YY.ZZ provides that the County Judge has the authority to "provide for the safety and security of the residents of the county." The safety of the county encompasses public alert and notification. The County Judge has determined that other specialists in emergency management and public safety are trained to provide public alerts and notifications. The County Judge has delegated the authority to distribute public alerts and notifications.

Authorized to send alerts:
The following are authorized to operate and distribute public alerts and notifications following Central County guidelines:

- Director of Emergency Management
- Assistant Director of Emergency Management
- Central County Sheriff
- 9-1-1 Director
- On-duty 9-1-1 shift supervisor

Authorized to request alerts:
The following positions are authorized to request public alerts and notifications be distributed:

- Central County Chief Deputy Sheriff
- Anytown Police Chief

- Anytown Assistant Police Chief
- Anytown Fire Chief
- Eastern VFD Fire Chief
- Western VFD Fire Chief
- Incident Commander of an event with more than one agency on-scene

Any authorized requestor will contact the 9-1-1 center to request an alert. The 9-1-1 center will process the request, but the request must be approved by an authorized sender prior to being sent to the public.

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Central County
Standardized Operational Guidelines

Page X of X
Number: 102
Subject: Alerting System Selection Guidelines Effective Date: 01-01-2013
Approved By: _____Version #: 2 Version Date: 01-01-2014

Purpose

System selection guidelines provide guidance for alerting operators to select the appropriate system. Alert and notification systems vary in terms of the time they take to disseminate messages and their effective coverage area. Users should select the appropriate systems based on two critical event-specific characteristics: onset and impact area.

Scope

This guideline applies to staff and volunteers of Central County and all subordinate political jurisdictions for the use of Central County public alerting systems.

Guidelines

The requesting authority will examine the available information regarding current and expected changes of an emergency. The requesting authority will determine the onset and impact area expected to be alerted.

Onset is the maximum time required to deliver a message to the public once an event occurs before adverse impact to that public. Onset is organized into the following categories:

- 0 to 20 minutes
- 21 to 60 minutes
- Hours
- Days

The impact area is the geographic region affected by an event and requiring coverage by an alert. This may be larger than the current area based on expected expansion of the event (e.g., wildfire). When selecting a system, over-alerting (i.e., extending alert coverage beyond the impact area) is typically preferable to under-alerting, but over-alerting can also lead to the public ignoring future alerts. Impact area is organized into the following categories:

- Localized Event: An event (e.g., a sinkhole) that affects a few blocks

- Community-wide Event: An event (e.g., a hazmat incident) that affects all or a major part of a single jurisdictional area
- Multi-community Event: An event (e.g., a tornado) that affects several communities within an area
- Regional Event: An event (e.g., a major flood) that affects an area encompassing many communities and requires assistance from state-level entities

Multi-community and regional events often involve multiple jurisdictions. For these events, alert and notification planning requires the use of the National Incident Management System (NIMS) to direct response and coordinate messaging for single events between jurisdictions. This type of collaborative effort could be undertaken, for example, by a unified command.

The alerting user can use the following table to select the appropriate systems. Users may have additional reports from other requestors and should use their best judgment in selecting the proper systems and area to alert. Alerting everyone every time is not a viable option.

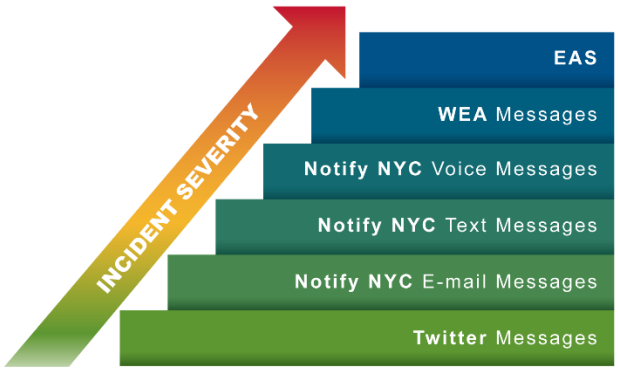
Area →	Localized				Community-wide				Multi-community				Regional			
Onset → / System ↓	0 – 20 minutes	21 – 60 minutes	Hours	Days	0 – 20 minutes	21 – 60 minutes	Hours	Days	0 – 20 minutes	21 - 60 minutes	Hours	Days	0 – 20 minutes	21 - 60 minutes	Hours	Days
Sirens	✓				✓											
Public Address	✓	✓			✓	✓										
Radio Alerting Systems	✓				✓											
Traffic Information and Control Systems						✓	✓	✓		✓	✓	✓		✓	✓	✓
Legacy Emergency Alert System (EAS)					✓	✓			✓	✓			✓	✓		
Social Media		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓

Onset ➔ / System ↓	0 – 20 minutes	21 – 60 minutes	Hours	Days	0 – 20 minutes	21 – 60 minutes	Hours	Days	0 – 20 minutes	21 - 60 minutes	Hours	Days	0 – 20 minutes	21 - 60 minutes	Hours	Days
Press Release			✓	✓			✓	✓			✓	✓			✓	✓
IPAWS – Wireless Emergency Alerts (WEA)					✓				✓				✓			
IPAWS - EAS					✓	✓			✓	✓			✓	✓		
IPAWS - Public Feed						✓	✓	✓		✓	✓	✓		✓	✓	✓
IPAWS – National Weather Radio (NWR)					✓	✓			✓	✓			✓	✓		
Other Systems						✓	✓	✓		✓	✓	✓		✓	✓	✓

Note: this table can be populated with check marks (as above); P for primary and S for secondary; or ranked 1, 2, or 3 as priorities for the user.

Another option is to list which systems to use based on severity of the incident. The following is an example of what New York City uses.

> *We can use WEA this way because we still use all the other alerting pathways that we had before we adopted WEA, including EAS, Notify NYC, and social media such as Twitter. We simply re-ranked these communication pathways based on incident severity, now accounting for WEA, as a result of our SOP analysis and updates …*



NYC OEM's Communication Pathways Ranked by Severity
[*adapted from NYC OEM 2012*]

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Central County
Standardized Operational Guidelines

Page X of X
Number: 103
Subject: Alerting System Timeframe Guidelines Effective Date: 01-01-2013
Approved By: _____Version #: 2 Version Date: 01-01-2014

Purpose

System timeframe guidelines provide guidance to alerting operators for when to use the appropriate system. Various systems are best used during certain times of the day.

Scope

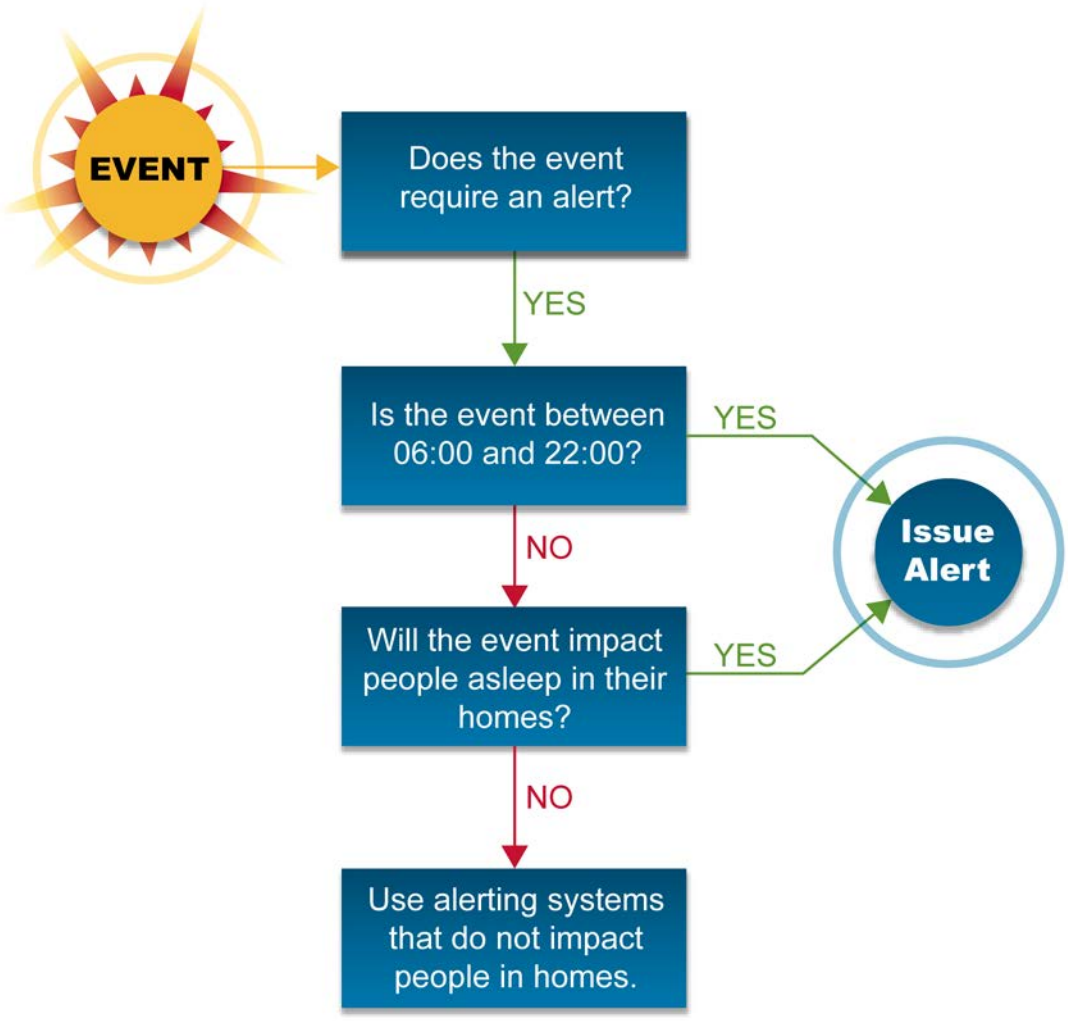
This guideline applies to staff and volunteers of Central County and all subordinate political jurisdictions for the use of Central County public alerting systems.

Guidelines

Users must select the appropriate system to use based on the emergency. The following systems will affect people in their homes at night and should only be used for emergencies that have an impact on the public in their homes:

- IPAWS – WEA
- ENS
- Radio alerting systems

The following guidelines can be used:


EVENT
Does the event require an alert?
YES
Is the event between 06:00 and 22:00?
YES
Issue Alert
NO
Will the event impact people asleep in their homes?
YES
NO
Use alerting systems that do not impact people in homes.

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Central County
Standardized Operational Guidelines

Page X of X
Number: 104
Subject: Alerting Process Guidelines — Effective Date: 01-01-2013
Approved By: _____Version #: 2 — Version Date: 01-01-2014

Purpose

Alerting process guidelines describe the processes used to initiate alerts to the public. Systems have different steps that need to be performed that a user might not remember in an emergency.

Scope

This guideline applies to staff and volunteers of Central County and all subordinate political jurisdictions for the use of Central County public alerting systems.

Guidelines

After the message and the target audience have been determined, users will activate the appropriate systems.

- Sirens
  - On the siren panel, turn key to "on"
  - Select appropriate button to activate
  - Activate sirens
  - Review log to ensure sirens sounded
  - Log activation
- IPAWS
  - Open the xxx application on the supervisor's computer
  - Enter user name and password
  - Select pre-formatted template and make needed edits or enter new message
  - Select appropriate dissemination channels
  - Enter remaining needed information
  - Review completed message
  - Send message

- Log activation

For any CSEPP community emergency, the alert will be re-sent according to alert and notification plans. For all other emergencies, the need to re-send an alert should be reviewed after 30 minutes or less depending on the emergency.

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Central County
Standardized Operational Guidelines

Page X of X
Number: 105
Subject: Alerting Notification Guidelines Effective Date: 01-01-2013
Approved By: _____Version #: 2 Version Date: 01-01-2014

Purpose

Alerting notification guidelines describe activities of users after an alert is sent. The alert may have an impact on other agencies, and the alerting authorities should be made aware of the emergency.

Scope

This guideline applies to staff and volunteers of Central County and all subordinate political jurisdictions for the use of Central County public alerting systems.

Guidelines

After any alert or notification is sent to the public using any Central County system, a notification that the message was sent to the public will be sent to the following:

- County Judge
- Emergency Management Director
- 9-1-1 Director
- State EOC

In addition, the nature of the event may require notification of other agencies. When an alert is sent, consider notifying the following if needed:

- Public Information Officer
- Neighboring jurisdictions
- Nearby first responders
- Nearby schools, hospitals, and care facilities
- Nearby mass gatherings
- Roads and highway department

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Central County
Standardized Operational Guidelines

Page X of X
Number: 106

Subject: Use of IPAWS for Pre-planned Events — Effective Date: 01-01-2013
Approved By: _____Version #: 2 — Version Date: 01-01-2014

Purpose

Guidelines for the use of IPAWS and distribution media for alerting the public to events that may pose a risk to the public due to pre-planned events are vital.

The use of IPAWS during a pre-planned event may be a viable method for alerting the public of the event and mitigating panic and risk to the public and participants. These messages would advise the public of the event and that there is no cause for alarm or warn the public of any risks. This guideline does not supplant the authority of the individual jurisdiction's elected officials and emergency management staff. Any alert must still be approved by the alerting authority for the jurisdiction before being sent.

Scope

This guideline applies to staff and volunteers of Central County and all subordinate political jurisdictions for the use of Central County public alerting systems.

Guidelines

During the planning of a pre-planned event (exercise or public event), the risks associated with the event should be identified. If the planned event has a potential risk to the public or public safety, the use of IPAWS to mitigate that risk may be appropriate. During the planning for each event, the authority will review the event and identify risks. These risks are reviewed against permitted uses and target audiences of the various IPAWS dissemination media. The alerting authority will determine if the use of IPAWS is appropriate. Guidelines for the use of IPAWS should be defined and documented in the event plan or an appendix.

For an alert to be sent to the WEA system, the event must meet the following criteria in accordance with 47 CFR 10.400:

> *(1) Urgency. The CAP Urgency element must be either Immediate (i.e., responsive action should be taken immediately) or Expected (i.e., responsive action should be taken soon, within the next hour).*

(2) Severity. The CAP Severity element must be either Extreme (i.e., an extraordinary threat to life or property) or Severe (i.e., a significant threat to life or property).

(3) Certainty. The CAP Certainty element must be either Observed (i.e., determined to have occurred or to be ongoing) or Likely (i.e., has a probability of greater than 50 percent).

Message Format/Content

When using IPAWS for a pre-planned event, the alerting authority has the ability to write alert messages in advance to properly communicate the message. Using message templates, various expected messages should be developed to use or have available in the event they are needed.

The alerting authority must be identified in all alert messages.

Each audience, message and distribution media should be reviewed. Is the audience smaller than the distribution media will reach? Will the message cause more concern to the public than the event? Below are some general guidelines for using the available distribution media.

It is not recommended that the authority use WEA messages unless it has the ability to include and edit the free-form 90-character <CMAMText> element into the CAP message.

The WEA message will also allow the alerting authority to make effective use of the <expires> element to keep alerts active for the time of the event. WEA messages, unlike EAS, will be broadcast to phones as they enter the selected area of the alert until the <expire> time.

EAS alerts will be distributed to the broadcast audience, which is often larger than the intended audience. For an event that is small and limited to a specific area, EAS may not be the best distribution medium. Understanding how your local broadcast stations are configured is important in selecting the proper distribution media.

NWEM is also sent to a transmitter that has a large coverage area. Users can use Specific Area Message Encoding (SAME) technology to limit this area, but this will still alert an entire county. In some cases, local broadcast media will monitor the NWEM feed and rebroadcast alerts as an EAS message.

When determining the event code to use, the following definitions of some common codes from the NWS Instruction 10-518 *Non-Weather Emergency Products Specifications* are provided to assist in compiling the alert message.

Civil Danger Warning (CDW). *A warning of an event that presents a danger to a significant civilian population. The CDW, which usually warns of a specific hazard and gives specific*

protective action, has a higher priority than the Local Area Emergency (LAE). Examples include contaminated water supply and imminent or imminent or in-progress military or terrorist attack. Public protective actions could include evacuation, shelter in place, or other actions (such as boiling contaminated water or seeking medical treatment).

Civil Emergency Message (CEM). *An emergency message regarding an in-progress or imminent significant threat(s) to public safety and/or property. The CEM is a higher priority message than the Local Area Emergency (LAE), but the hazard is less specific than the Civil Danger Warning (CDW).*

Local Area Emergency (LAE). *An emergency message that defines an event that, by itself, does not pose a significant threat to public safety and/or property. However, the event could escalate, contribute to other more serious events, or disrupt critical public safety services. Instructions, other than public protective actions, may be provided by authorized officials. Examples include a disruption in water, electric or natural gas service, or a potential terrorist threat where the public is asked to remain alert.*

Law Enforcement Warning (LEW). *A warning of a bomb explosion, riot, or other criminal event (e.g. a jailbreak). An authorized law enforcement agency may blockade roads, waterways, or facilities, evacuate or deny access to affected areas, and arrest violators or suspicious persons.*[37]

Procedure

When using IPAWS for a pre-planned event, the following procedures should be followed:

1. Determine the need
    a. Determine the event and expected outcomes
    b. Determine the risks involved
    c. Determine the benefit that IPAWS can bring to mitigating these risks
2. Determine whether the use of IPAWS is a benefit and is permitted
    a. Alert authority determines that the use is appropriate given the risk and benefits
    b. Incorporate IPAWS into planning process
    c. Develop message templates
3. Coordinate with other jurisdictions and public and private partners

[37] National Weather Service, Operations and Services; Public Weather Services, NWSPD 10-5, *Non-Weather Emergency Products Specification* (Instruction 10-518, July 28, 2010)

a. Notify surrounding jurisdictions of the plan
b. Notify the State of the plan

4. Execute the plan
   a. Follow the plan for the use of IPAWS
   b. Notify surrounding jurisdictions when it is activated
   c. Notify the State when it is activated
   d. Notify all parties of any changes in the plan
   e. Notify all parties when event is completed

Appendix K: IPAWS Exercise Worksheet

The IPAWS Exercise Worksheet can be found on the following page and as an attached Word file.

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- Simulated – How it is currently handled, with the operator pretending to send alerts
- Lab – Delivering exercise messages to the Joint Interoperability Test Command
- Live – Delivering exercise messages to the public

If an exercise program was developed or IPAWS was integrated into the regular exercise program, what would the objectives of the inclusion be? How would the objective be measured?

	Objectives	Measures
Simulated		
Lab		
Live		

Appendix L: Testing with IPAWS Lab

The Testing with IPAWS Lab document can be found as an attached PDF.

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Appendix M: IPAWS Message Viewer

The IPAWS Message Viewer Instructions can be found as an attached PDF.

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Appendix N: Model Public Affairs Communications Plan

The Public Affairs Communications Plan can be found on the following pages and as an attached Word file.

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Public Affairs Communications Plan

Integrated Public Alert and Warning System (IPAWS) Test

Plan Purpose

> *"A public that can and will protect itself in the event of a chemical emergency" — Public Affairs IPT Mission Statement*

The primary purpose of this plan is to mitigate public and media concerns that could arise because of the test of the Integrated Public Alert and Warning System (IPAWS) including Wireless Emergency Alerts (WEA). This plan outlines the methods that will be used to provide coordinated, consistent messages while ensuring that all parties (internal and external) are aware of the test and are provided the opportunity to become familiar with the new means of public alert and warning.

Action Plan

Key Audiences

- Primary: External—people who live or work in the CSEPP response zones (Immediate Response Zone [IRZ] and Protective Action Zone [PAZ])
- Secondary: Internal—staff, partner agencies, and key community communicators

Key Messages

- New way to warn the public in emergencies.
- Testing following the CSEPP Exercise on Month Day, Year
- Here's what the public will see or hear:
  - EAS message
  - Text Message on cell phone.
- Here's how to get more information_____.

Designated Spokespersons

- Major County: John Doe, Public Information Officer, (555) 555-2345
- State: Jane Doe, Public Information Officer, (555) 555-1234
- Other PIOs?

Activities

Date	Activity	Responsibility	Date Accomplished
	Development of key messages and designated spokespersons A common set of talking points allows all players to emphasize basic points while referring more technical questions to the appropriate designated spokesperson(s).	John/Jane	7/18/2013
	Distribution/integration of key messages and tools Provide the public affairs team and other appropriate internal team members the key messages and designated points of contacts.	John	
Ongoing	**Respond to/document media or public inquiry** Use key messages to respond to media or public inquiry. Keep fellow site public affairs officers appraised of media contacts and questions. Document contact in case follow-up is needed at a later date.	PIOs	Ongoing
	Modify existing outreach tools to reflect new IPAWS alerts Tabletop display, PowerPoint presentations, website pages	Websites— PowerPoint presentations—Public Information Officers (PIOs) modify their power points with new slides.	Web—October 20 PowerPoint presentations—October 20
	Key message integration into CSEPP presentations, outreach events, tours, briefings	PIOs	October 20
	Key message integration into Depot presentations, outreach events, tours CSEPP will provide talking points for Depot Public Assistance Officers (PAOs) and Outreach Office personnel to use in their presentations, at outreach events, and during tours.	John	October 20
City Councils CAC	**Elected official/legislative briefings** Presentations relating to CSEPP activities are given on an ongoing basis to local emergency management boards, first responders, elected officials, legislative aides, and the	City Councils— CAC—	City Councils— CAC—September 10

Date	Activity	Responsibility	Date Accomplished
	Citizens' Advisory Commission (CAC). Updates will be given in person, by fax and email, and by telephone.		
Production Ready for demo by October 1 Ads run Radio—all October? TV—Nov. 11–15 Print—Nov 10–17	Paid advertisements. Incorporate key messages into paid advertisements in newspapers and on radio.	Radio— Print— TV—	November XX—production complete
Chamber of Commerce Deadlines Oct. XX, Mycity Oct. XX, Anytown Nov. XX, ??? City Oct. XX, Mycity Nov. XX, Anytown Nov. XX, ??? Business Hospitals	**Newsletter/Public (outreach)** CSEPP will target the August editions of area civic and business newsletters for placement of a story about the IPAWS test.	Research deadlines and how to submit— Distribution of article—	October XX—emailed
September XX ?? TBD	**Newsletter/employee and partner agency (in-reach)** CSEPP will provide an article on the IPAWS test for two newsletters: the "News," which is produced on a monthly basis, and the "Detonator," which is produced on a ??? basis.		

Date	Activity	Responsibility	Date Accomplished
Detonator	Both are distributed to employees and partner agencies with the idea that they are program representatives in the eyes of their families, friends, and neighbors.		
	Social Media Update social media pages and put out messages notifying the public.	Facebook— ▪ Prepare Website— ▪ County— ▪ State—	
November 5 November 12 November 19	**Personal notifications** A series of three emails will be sent CSEPP staff, partner agencies, responders, and key community communicators (i.e., police and fire chiefs, elected officials, school districts and CAC members) to advise them of the change and provide answers they can use if questioned.		
	Press release. Press release on IPAWS test will be prepared and sent to local newspapers and broadcast media.	John	October/November XX—media campaign release
	Live appearances on local broadcast media (radio and TV) programs Schedule live appearances on local radio and/or cable TV talk shows.	Schedule— Appear—	November XX—local radio interview November XX—local radio interview
October 23 November 13	**Messaging to Broadcasters** Chair Broadcasters Association will send an ECAST message to state broadcasters but needs to be reminded. Month prior: send reminder that Automatic relay for Civil Emergency messages need to be configured Week prior: send reminder that the test will be taking place.		
	Highway Reader board Ensure that the reader board has information that there is a text-message exercise in progress.		
December	**Annual Report** The IPAWS test will be noted in the end-of-the-year CSEPP report.		

Performance Measurement

The Public Affairs team will attempt to assess the impacts and success of this plan by monitoring both outputs (activity generated because of these actions) and outcomes (public knowledge).

Outputs: Statistical information will be gathered in the following areas:

- Media inquiries
- Media stories generated
- Public phone calls
- Number of web page hits
- Response pieces mailed
- Presentation requests

Outcomes: Public knowledge, changes in knowledge, and/or knowledge voids can be assessed in part using ongoing public surveys being conducted in partnership with the site and Public Affairs team. Surveys conducted prior to the implementation of this plan will serve as a baseline for prior knowledge.

Appendix O: Model Message Template and Example

The Message Template and an example can be found on the following pages and as an attached Word file.

The remainder of this page intentionally left blank.

Insert Agency Logo Here

EMERGENCY ALERT MESSAGE

Agency/Jurisdiction Name
Address
City, State XXXXX
Phone: (XXX) XXX-XXXX

Date: _____Time:_____ Event Code: _____
(*Required 3-character code*)

Headline ***160 characters or less including spaces.***
Insert text here
Description: What, where, how does this impact the public, for how long?
Description and Instruction combined must be less than 160 words.
Insert text here. #[incident name]
Instruction: What to do to stay safe and how to do it.
Description and Instruction combined must be less than 160 words.
Insert text here.
WEA Message (Parameter CMAMtext) ***This is the message that will be received on cell phones.***
90 characters or less including spaces. Cannot contain URL or phone number links. It must include sending agency identifier, e.g., NWS or Sheriff.
Insert text here.
Twitter Message
140 characters or less including spaces.
Insert text here. #[incident name]

Hint: To find the word and/or character count, highlight the text and click "Words:" in the bottom left of your screen. The pop-up box will show the word and character count (with spaces.)

EMERGENCY ALERT MESSAGE [SAMPLE]

Best County Emergency Management Agency
123 South Main Street
Anytown, Kentucky 54321
Phone: (555) 555-1234 Fax: (555) 555-5678

Headline ***160 characters or less including spaces.***
County shelter-in-place advised due to Army Depot emergency
Description: What, where, how does this impact the public, for how long?
Description and Instruction combined must be less than 160 words.
At 10:00 AM today, an incident occurred at the Army Depot near Anytown that involved the release of toxic chemicals in areas of Best County. Due to the expected health effects of these chemicals, emergency officials are recommending immediate shelter-in-place for people in the following zones: 1-A, 1-B. Zones 1-A and 1-B include the following communities: Anytown, Mycity, and Best. Other areas in Best County are not affected at this time, but residents should stand by for additional information. #Release01
Instruction: What to do to stay safe and how to do it.
Description and Instruction combined must be less than 160 words.
To shelter-in-place, do the following: ▪ Move inside immediately ▪ Close and lock all windows and doors ▪ Turn off ventilation system and all fans ▪ Go into and seal your chosen room with plastic sheeting and duct tape ▪ Listen to local radio stations via portable battery-operated radio Stay tuned to this station for updates and instructions for Best County residents/
WEA Message (Parameter CMAMtext) ***This is the message that will be received on cell phones.***
90 characters or less including spaces. Cannot contain URL or phone number links. It must include sending agency identifier, e.g., NWS or Sheriff.
BC EMA: Chemical Depot emergency. Shelter-in-Place now. CSEPP Zones 1-A & 1-B.
Twitter Message
140 characters or less including spaces.
Immediate Shelter-in-Place in CSEPP Zones 1-A and 1-B advised to due to chemical emergency at Grass Depot. #Release1

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Appendix P: Helpful Links

Request COG:

- Email to ipaws@fema.dhs.gov, with the subject line "COG Application": OR
- Download form from https://www.fema.gov/media-library/assets/documents/112266 (accessed January 23, 2019)

FEMA IPAWS Information:
https://www.fema.gov/integrated-public-alert-warning-system (accessed January 23, 2019)

IPAWS Classes:

- IS-247.A: Integrated Public Alert and Warning System (IPAWS) https://training.fema.gov/is/courseoverview.aspx?code=IS-247.a (accessed January 23, 2019)
- IS-251: Integrated Public Alert and Warning System (IPAWS) for Alerting Authorities https://training.fema.gov/is/courseoverview.aspx?code=IS-251 (accessed January 23, 2019)
- IS-248: Integrated Public Alert and Warning System (IPAWS) for the American Public https://training.fema.gov/is/courseoverview.aspx?code=IS-248 (accessed January 23, 2019)

The link to the live IPAWS feed is:
http://ipawsnonweather.alertblogger.com/ (accessed January 23, 2019)

The link to the IPAWS Viewer is:
https://ipaws-open.net/ALERT_SERVICES/postedmessages.php?COGID= ######
Make sure you add your test COG ID number to the end (accessed January 23, 2019).

The Alert Symbology is being managed by the National Alliance for Public Safety GIS (NAPSG) Foundation at:
https://www.napsgfoundation.org/ (accessed January 23, 2019)

Guidelines on use and format of the symbols is located at:
https://www.napsgfoundation.org/wp-content/uploads/2015/10/IncidentSymbol_Guideline_20160830_v2.0_PDF.pdf (accessed January 23, 2019)

Icons are available in the symbol library tool at:
http://napsg-web.s3.amazonaws.com/symbology/index.html#/ (accessed January 23, 2019)

Specific Public Alert symbols are at:
http://napsg-web.s3.amazonaws.com/symbology/index.html#/subcat?Public%20Alert (accessed January 23, 2019)

FCC Report and Recommendations, Hawaii Emergency Management Agency, January 13, 2018, False Alert
https://www.fcc.gov/document/fcc-releases-report-hawaii-false-emergency-alert (accessed January 23, 2019)

FCC CSRIC IV WG3 EAS Security Subcommittee Initial Report May 2014
https://transition.fcc.gov/pshs/advisory/csric4/CSRIC_IV_WG3-EAS_SECURITY_INITIAL_REPORT_062014.pdf (accessed January 23, 2019)

FCC EAS Operating Handbook
https://www.fcc.gov/general/eas-test-reporting-system (accessed January 23, 2019)

FCC State EAS Plans and State Emergency Communications Committee (SECC) Chairs Webpage
https://www.fcc.gov/public-safety-and-homeland-security/policy-and-licensing-division/alerting/general/state-eas-plans (accessed January 23, 2019)

Appendix Q: Abbreviations

ANI	Automatic Number Identification
ANSI	American National Standards Institute
ASL	American Sign Language
AWARN	Advanced Warning and Response Network
CAP	Common Alerting Protocol
CDW	Civil Danger Warning
CEM	Civil Emergency Message
CFR	Code of Federal Regulations
CMIP	Common Management Information Protocol
CMRS	Commercial Mobile Radio Service
COG	Collaborative Operating Group
CONELRAD	CONtrol of ELectromagnetic RADiation
CPG	Comprehensive Preparedness Guide
CPU	Central Processing Unit
CSEPP	Chemical Stockpile Emergency Preparedness Program
CSRIC	Communications Security, Reliability and Interoperability Council
DHS	U.S. Department of Homeland Security
EAS	Emergency Alert System
EMA	Emergency Management Agency
EMI	Emergency Management Institute
EOP	Emergency Operations Plan
Esri	Environmental Systems Research Institute
ETNS	Emergency Telephone Notification System
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FIPS	Federal Information Processing Standard
GIS	Geographic Information System
GUI	Graphical User Interface
HazCollect	All-Hazards Emergency Message Collection System
HSDL	Homeland Security Digital Library
HSEEP	Homeland Security Exercise and Evaluation Program
ICS	Incident Command System
ID	Identification
IEEE	Institute of Electrical and Electronics Engineers
ILEC	Incumbent Local Exchange Carrier
IPAWS	Integrated Public Alert and Warning System
IPAWS-OPEN	IPAWS Open Platform for Emergency Networks
IPT	Integrated Process Team
IT	Information Technology
ITB	Invitation to Bid
JITC	Joint Interoperability Test Command
LAE	Local Area Emergency
LAN	Local Area Network
LEW	Law Enforcement Warning

LP	Local Primary (station)
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NENA	National Emergency Number Association
NFR	National Response Framework
NOAA	National Oceanic and Atmospheric Administration
NTP	Network Timing Protocol
NWEM	Non-Weather Emergency Message
NWS	National Weather Service
OS	Operating System
OSI	Open Systems Interconnection
P2P	Peer-to-Peer
PA	Pubic Address
PC	Personal Computer
PEP	Primary Entry Point
PMO	Program Management Office
POTS	Plain Old Telephone System
REPP	Radiological Emergency Preparedness Program
RFB	Request for Bid
RFP	Request for Proposal
RWT	Required Weekly Test
SECC	State Emergency Communications Committee
SNMP	Simple Network Management Protocol
SOP	Standard Operating Procedure
SP	State Primary (station)
START	Study of Terrorism and Responses to Terrorism
SWAT	Specialized Weapons and Tactics
TAR	Tone Alert Radio
TDD	Telecommunications Devices for the Deaf
TDL	Test Development Lab
UL	Underwriters Laboratories
URL	Uniform Resource Locator
VoIP	Voice Over Internet Protocol
WEA	Wireless Emergency Alerts
XML	Extensible Markup Language