September 2010

WORKING GROUP 5A
CAP Introduction

Final Report

Table of Contents

1 Results in Brief 3
1.1 Executive Summary 3
2 Introduction 4
2.1 CSRIC Structure 4
2.2 Working Group 5A Team Members 5
3 Objective, Scope, and Methodology 5
3.1 Objective 5
3.2 Scope 6
3.3 Methodology 6
3.3.1 Sub-Group Structure 6
3.3.2 Collaboration via Portal 6
4 Background 7
4.1 Emergency Alert System (EAS) 7
4.1.1 State and Local CAP-based EAS Programs 7
4.1.2 Emerging Advanced EAS Capabilities 8
4.1.3 State and Local EAS Plans 9
4.1.4 State and Local Emergency Communication Committees 10
4.1.5 Training 10
4.2 IPAWS 11
4.2.1 System Overview and Vision 11
4.2.2 Current Schedule for 2012 12
4.2.3 Common Alerting Protocol (CAP) 12
4.2.4 Geo-Targeted Alert System (GTAS) 13
4.3 Commercial Mobile Alert System (CMAS) 13
5 Analysis, Findings, and Recommendations 14
5.1 Revisions to Part 11 Rules 15
5.2 Citizens with Disabilities 18
5.3 Citizens not Proficient in English 21
5.4 Defining the CAP Standard 22
5.4.1 IPAWS CAP Profile 23
5.4.2 EAS-CAP Implementation Guide 23
6 Conclusion 24

DRAFT

1 Results in Brief

1.1 Executive Summary

The Communications Security, Reliability and Interoperability Council (CSRIC) is a federal advisory committee established to provide recommendations to the Federal Communications Commission (FCC) on how to ensure optimal security, reliability, and interoperability of communications systems, including public safety, telecommunications, and media communications. This includes, but is not limited to, recommending ways, including best practices, to improve the Emergency Alert System (EAS) operations and testing, and to ensure that all Americans, including those living in rural areas, the elderly, people with disabilities, and people who do not speak English, have access to timely EAS alerts and other emergency information. Pursuant to this mandate, Working Group 5A spent over six months researching, analyzing, and evaluating a vast array of ideas, concepts, and themes on possible actions the FCC could take to improve the EAS.

First, the working group found that widespread adoption of the Common Alerting Protocol (CAP) would not only advance the EAS, but would ensure that all Americans, including those with disabilities or non-English speaking individuals would have access to emergency information. CAP is an XML-based data format for exchanging public warnings and emergencies between alerting technologies. CAP allows a warning message to be consistently disseminated simultaneously over many warning systems to many applications, thus simplifying the task of activating a warning for responsible officials. To facilitate a seamless adoption of CAP by all the EAS participants, this report recommends that the FCC revise its rules governing the EAS to accommodate CAP; this includes extending the timeline by which all EAS participants are expected to adopt CAP from 180 days to 360 days based on a number of factors including FEMA's adoption announcement.

Next, the working group determined that more than 14,000 broadcast stations and 10,000 cable systems across the nation are required to follow both their state and local EAS plans during an emergency. These plans specify the monitoring assignments for all broadcast stations and cable systems within their respective state(s). This report recommends that the FCC ensure that state and local governments update their EAS plans to accommodate CAP in a timely fashion.

As more people transition from traditional wireline phone systems and TTY to Internet-based technologies as their primary means of communication, this working group believes that it is important that these platforms continue to facilitate the delivery of emergency messages to disabled citizens. This could be achieved through the development of a national relay center, which disabled individuals could contact to learn more about a local event after receiving an initial alert through traditional channels. Such a center should be a source of information for the deaf and hard of hearing, the blind and visually impaired, caregivers in group homes, and people with physical disabilities. The FCC should consider initiating a proceeding or hosting a workshop to explore the feasibility of developing such a center.

Finally, given the growing multilingual population in the United States, this report recommends that the responsibility for message translation from English to another language should like with the message originators at this time. U.S. Census data and social science research could be used

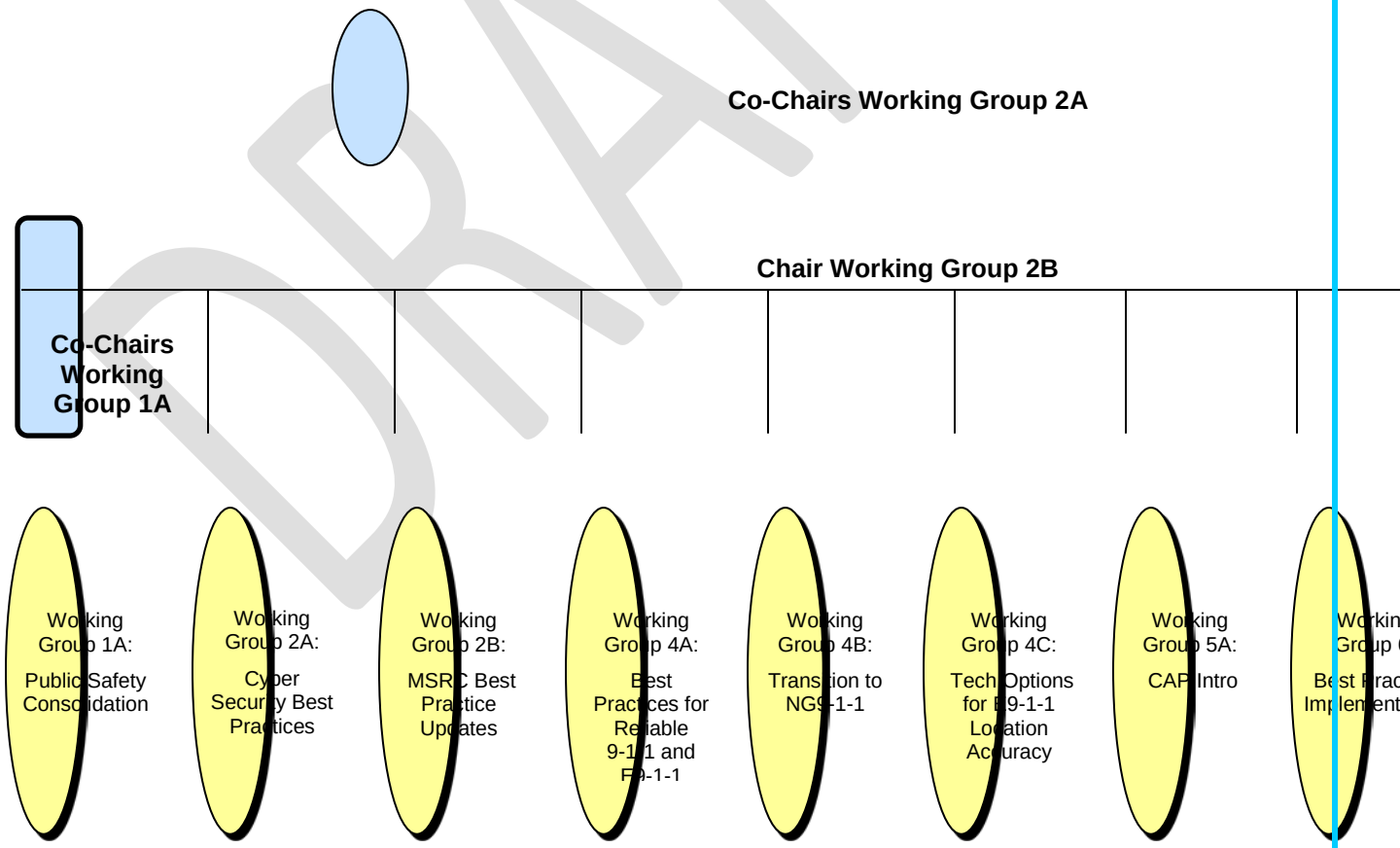
to identify geographic areas with high density of non-English speaking population that require translation services. As language translation technology improves, going forward the Commission should research methodologies employed by bilingual and multilingual countries such as Canada, Israel, Belgium, to name a few.

2 Introduction

The FCC held the first meeting of the CSRIC in early December 2009. The CSRIC was established as a federal advisory committee designed to provide recommendations to the Commission regarding best practices and actions the Commission may take to ensure optimal operability, security, reliability, and resiliency of communications systems, including telecommunications, media, and public safety communications systems.

Due to the large scope of the CSRIC mandate, the committee then divided into a set of Working Groups, each of which was designed to tackle individual issue areas. In total, 10 different Working Groups were created, including Working Group 5A on the CAP Introduction. Working Group 5A officially started its work in March 2010 and was given until September 2010 to produce this Final Report.

2.1 CSRIC Structure



2.2 Working Group 5A Team Members

Working Group 5A is comprised of 22 members, including its two Co-Chairs; Damon Penn of the Federal Emergency Management Agency (FEMA) and Pat Roberts, of the Florida Association of Broadcasters. Members come from a wide variety of private and public entities, many of which possessed an extensive background in broadcasting and emergency messaging. The FCC Liaison for Working Group 5A is Eric Ehrenreich.

Name	Company
Damon Penn, Co-Chair	Federal Emergency Management Agency (FEMA)
Pat Roberts, Co-Chair	Florida Association of Broadcasters
Sam Asher	Asher Group
Paul Brenner	Emmis Communications
Leonard Charles	Morgan Murphy Media, Midwest
Turner Clayton Jr.	Seminole County, FL branch of NAACP
Edward Czarnecki	Monroe Electronics, Inc.
Brian Daly	AT&T
J. Scott Enright	Emmis Communications
Nneka Ezenwa	Verizon
Robert Gabrielli	DirecTV
Mike Gerber	NOAA National Weather Service
Denis Gusty	Department of Homeland Security
John Lawson	Convergence Services
Marc Pucci	Telcordia
Mary Retka	Qwest
Mark Titus	TeleCommunication Systems, Inc.
Scott Tollefsen	USA Mobility (former General Counsel
Herbert White	NOAA National Weather Service
Kelly Williams	National Association of Broadcasters
Eric Ehrenreich	FCC Liaison
Jean Ann Collins	FCC Lead

3 Objective, Scope, and Methodology

3.1 Objective

In its May 2007 EAS Second Report and Order (EB Docket No. 04-296), the Commission mandated that all EAS Participants must be capable of receiving a CAP-formatted EAS alert within 180 days of an announcement by FEMA adopting CAP. The Commission noted that the transformation of the EAS brought about by CAP would necessitate revisions to the Commission's Part 11 Rules governing the EAS. The Working Group was asked to provide the proposed recommendations for revisions to the Part 11 Rules. The Working Group specifically based its recommendations found in this Final Report on the Oasis-published CAP 1.2[1], and included in their discussion both specific recommendations regarding rule changes and more

[1] OASIS CAP 1.2 documents: http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2-os.pdf

general comment and analysis regarding the appropriate Part 11 regulatory structure for a CAP-based EAS. In this Final Report, the Working Group also recommended actions the FCC can take to improve EAS access for people with disabilities and non-English speaking communities.

3.2 Scope

Per the Working Group 5A description, the group focused primarily on the FCC Part 11 Rules governing the EAS.

3.3 Methodology

The 5A Working Group used a collaborative, inclusive approach to its work. Given the vast array of expertise the 5A members brought to bear on this effort, it was critical to provide a multitude of forums and mediums through which participants could express their opinions and help shape this Final Report. The following section details the methodology through which 5A achieved this objective.

3.3.1 Sub-Group Structure

After its initial set of meetings, the Co-Chairs of Working Group 5A decided to the review the structure of the Working Group and develop a plan that would allow for 5A to proceed with its study in an organized fashion which leveraged the diverse backgrounds of the Group's membership. As such, 5A broke into two Sub-Groups – one focused on Policy issues, while the other focused on Technical issues. The two Sub-Groups then moved forward with independent conference calls that focused almost exclusively on the portions of the Part 11 Rules most applicable to their expertise.

Over the course of several months, each Sub-Group met via conference call on a weekly basis. Each Sub-Group had a Lead who developed an agenda and framed conversation and discussion amongst the participants. On some of the more divisive issues the Lead worked to bring members closer to consensus and encouraged open dialogue designed to find common ground.

For each Sub-Group meeting extensive notes were captured and analyzed to determine if there was overlap in the issues being discussed. In some instances it became clear that both Sub-Groups needed further clarification on certain topics, in which case full Working Group meetings were called and Subject Matter Experts were brought in to add clarity to some of the issues. In other instances it appeared both Sub-Groups were covering the same topics during their independent meetings. In those cases, again, full Working Group meetings were called in order to work toward a consensus as a unified body and to avoid further duplication of effort.

3.3.2 Collaboration via Portal

In addition to the regular conference calls, an online collaboration portal featuring an array of Social Media capabilities was designed and implemented for use by the 5A participants. The portal was accessible to all Working Group members throughout the duration of their work on behalf the CSRIC. The table below details some of the most prominent capabilities featured on the Portal and how they were used by the members of the 5A Working Group.

Document Repository	Collaboration space where members posted, reviewed, and edited documents
Forum	Open space where issues were discussed amongst members
Calendar	Central location where all relevant meetings and events were documented
Links	Location where external internet links pertinent to CSRIC were posted.

From its inception, the portal became a useful tool for the Working Group as they shared ideas, resources, and collaborated on common documents, including this Final Report. Given the disparate locations from which the 5A members originated, having an online collaboration tool was instrumental to the successful completion of the Working Group's final product.

4 Background

From the onset of 5A's work, close attention was paid to the researching relevant topics, including the EAS, the Integrated Public Alerts and Warning System (IPAWS), the CAP, and the Commercial Mobile Alert System (CMAS) and other alerting methodologies. Several members of the 5A Working Group brought specialized expertise in one or more of these areas that helped establish a baseline understanding of these related topics and served as a catalyst for promoting discussion and the development of the Working Group's final recommendations.

4.1 Emergency Alert System (EAS)

EAS is the primary national warning system that provides the President with the means to address the nation during a national crisis. State and local officials also use EAS to issue warning messages about imminent or ongoing hazards in specific regions. Three Federal agencies are responsible for EAS: the FCC, FEMA, National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS). Functionally, EAS is a hierarchical alert message distribution system. Initiating an EAS message, whether at the national, state, or local level, requires the message initiator (e.g. FEMA, which initiates EAS alerts at the national level on behalf of the President) to deliver specially-encoded messages to a broadcast station-based transmission network that, in turn, delivers the messages to individual broadcasters, cable operators, and other EAS Participants. EAS Participants maintain special encoding and decoding equipment that can receive the message for retransmission to other EAS Participants and to end users (broadcast listeners and cable and other service subscribers).

On May 31, 2007 the FCC adopted a *Second Report and Order and Further Notice of Proposed Rulemaking* (EB Docket 04-296, FCC-07-109A1) (Erratum, DA-07-4002A1) to strengthen the EAS and to promote the development of fully digital next generation technologies and delivery systems for EAS. The *Second Report and Order* requires EAS participants to accept messages using CAP, the groundwork for next generation EAS delivery systems, no later than 180 days after FEMA announces its adoption of standards in each case. CAP is intended to ensure the efficient and rapid transmission of EAS alerts to the public in a variety of formats (e.g. text, audio and video) and via different channels (e.g. broadcast, cable, satellite, and other networks).

4.1.1 State and Local CAP-based EAS Programs

Historically, the EAS has been one of several federally managed warning systems. FEMA jointly administers EAS with the FCC, in cooperation with the NWS. The NOAA Weather Radio system has been upgraded to an all-hazard warning capability.

However, while federally managed, the actual operation and maintenance of the majority of the nation's emergency alert capabilities (except for the PEP system) has been conducted by state, local, municipal and territorial governments and broadcasters. Under the current EAS, a national system was created whose component parts rapidly came to be used for state and local purposes, and operated at a state and local level.

4.1.2 Emerging Advanced EAS Capabilities

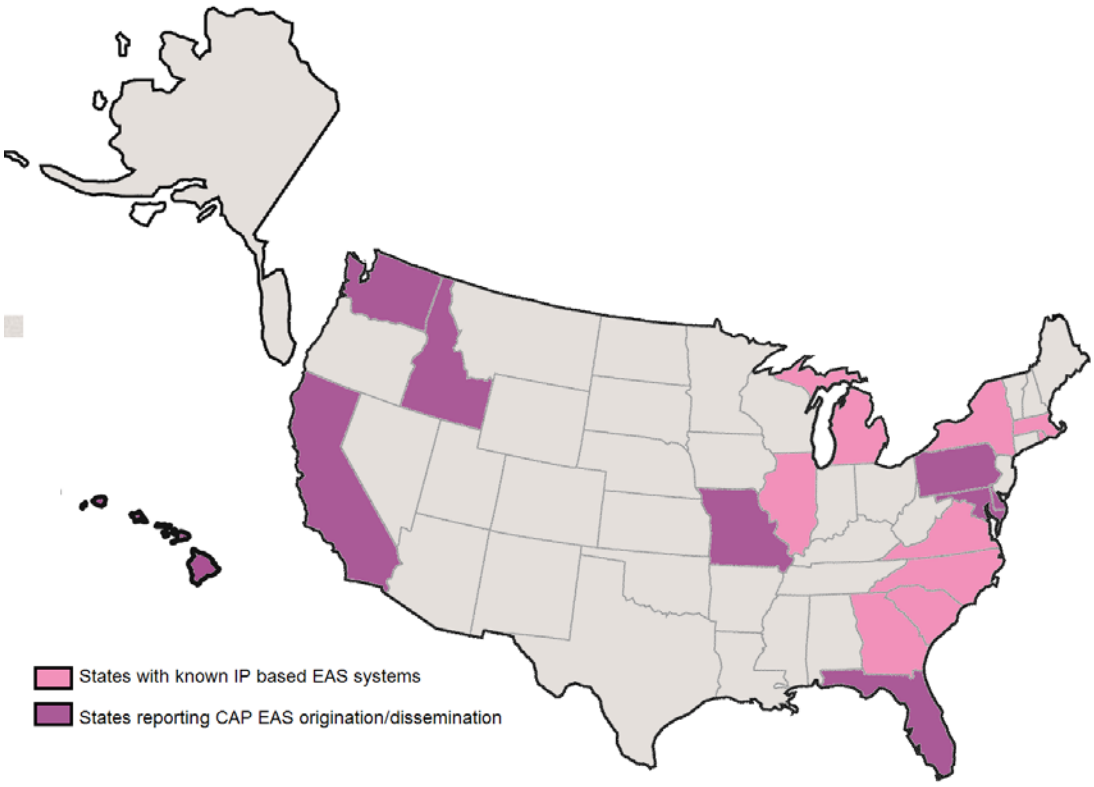
There are a growing number of existing state/local advanced IP-based EAS networks across the United States, many of which already utilize the CAP data format, as well as numerous local jurisdictions with their own CAP EAS systems and pilots.

Via a survey conducted by the Texas Association of Broadcasters and other resources, IP based systems are observed in the following 18 states (plus the District of Columbia), of which at least 10 are already originating and disseminating CAP messages for EAS, and the remainder appear to have near-term plans to begin introducing CAP message origination and dissemination within their state systems:

- California **
- District of Columbia **
- Delaware **
- Florida **
- Georgia
- Hawaii (pilot) **
- Idaho (pilot) **
- Illinois
- Michigan
- Maryland **
- Massachusetts
- Missouri **
- New York (pilot)
- North Carolina
- Pennsylvania **
- Rhode Island
- South Carolina
- Virginia
- Washington **

*** denotes respondent indicating currently distributing CAP messages for EAS*

DRAFT



Note: There are additional states such as Indiana currently evaluating the use of existing state data relay networks for CAP EAS distribution.

State and local CAP-EAS distribution networks are infrastructures intended to efficiently deliver alert and warning content to end users, in this case to EAS participants. Where advanced EAS capabilities have not yet been deployed, emergency managers continue to utilize EAS in traditional manners. Emergency managers, and state police agencies often in the case of AMBER Alerts, can originate EAS alerts through their own EAS encoder equipment, via direct request to a broadcaster or cable operator, or via the NWS. These legacy systems and procedures will need to be upgraded or replaced to accommodate for the origination and delivery of CAP based alerts.

4.1.3 State and Local EAS Plans

More than 14,000 broadcast stations and 10,000 cable systems across the nation are required to follow their state EAS plans, as well as local EAS plans in many cases. Each state's plans specify the monitoring assignments for all broadcast stations and cable systems within that state. These plans and monitoring assignments will need to be updated to accommodate CAP EAS systems. Several states are known to be currently updating their State EAS Plans to reflect current or planned CAP EAS origination and distribution capabilities. However, in most cases, state and local areas have not yet filed updated EAS plans to reflect the usage of these next generation CAP-based capabilities.

As specified in the FCC Part 11 regulations, EAS plans contain guidelines that must be followed by broadcast and cable personnel, emergency officials and NWS personnel to activate the EAS. This requirement would presumably continue with the adoption of CAP EAS systems. Revised state and local CAP EAS plans will contain unique methods of EAS message IP distribution, such as satellite, terrestrial wireless, Internet, and/or other means.

According to FCC regulations, EAS plans must be reviewed and approved by the Director, Office of Homeland Security, Enforcement Bureau, FCC, prior to implementation to ensure they are consistent with national plans, FCC regulations, and EAS operation. It is reasonable to assume that updated State plans will continue to contain procedures for State emergency management and other State officials, the NWS, and broadcast and cable personnel to transmit emergency information to the public during a State emergency using the EAS.

Similarly, updated Local Area plans will contain procedures for local officials or the NWS to transmit emergency information to the public during a local emergency using the new CAP EAS capabilities. Local plans may be included in the State plan. A Local Area is a geographical area of contiguous communities or counties that may include more than one state.

4.1.4 State and Local Emergency Communication Committees

State and Local Emergency Communication Committees (SECCs and/or LECCs) are constituted by broadcasters, cable operators, emergency managers and others concerned with EAS. These entities design a monitoring plan that determines what entities will serve as the EAS sources and originators of messages (Emergency Operation Centers, 911 centers, NWR, etc.). These monitoring plans will need to be evaluated and potentially reconsidered in light of CAP EAS requirements. SECCs and LECCs also decide what communications assets are available, who is authorized to issue warnings, how they will do so, which EAS codes will be issued in their region, and how and when officials will participate in EAS tests.

The committee stakeholders will continue to have a critical role designing the most effective CAP-based EAS communications network at the state and local level, determining legacy EAS and CAP-based EAS monitoring assignments. They also decide who is authorized to issue warnings, how they will do so, proper authentication procedures, and which EAS codes will be considered essential within their region. Thus, the state and local plans will have a key role in mapping out how state and local CAP EAS systems are "wired together."

4.1.5 Training

FEMA is creating an online training program for emergency managers who have never before

been exposed to IPAWS. FEMA's Emergency Management Institute is developing a web-based independent study course that will be available on FEMA's Emergency Management Institute's eLearning system and/or the FEMA Employee Knowledge Center. The course goals are to help state, local, tribal, and territorial emergency managers draft better alerts and warning messages, to improve skills in using emergency alerting equipment, and to increase the effectiveness and participation of emergency managers using the EAS.

4.2 IPAWS

Developed by FEMA, IPAWS is the Nation's next generation public alerting system. It 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. IPAWS is building additional redundancy EAS by establishing diverse dissemination paths including Internet Protocol networks. It will provide a digital interface to EAS and CMAS participants (e.g., broadcasters, cable systems, and commercial cellular carriers providing broadcast cellular alerts), NWS, as well as Internet Service Providers. In addition, the program is developing standards that support interoperability with state and local warning systems.

4.2.1 System Overview and Vision

The IPAWS vision is an effective and comprehensive system that enables the proper authorities to alert and warn the American people under all conditions through as many means as possible. Incident response and public alerts begin at the local level. Thus, IPAWS also is developing the protocols to enable existing local and State public alert and warning systems to be interoperable with – and leverage – IPAWS architecture. As an example, assume a railroad tanker car is leaking chlorine chemical in a particular geographic area. A state, local, tribal, or territorial authenticated alerting authority can send a Shelter-in-Place Warning alert through their local system and to the IPAWS interface at the same time. IPAWS would validate the message format and route the alert message to the appropriate disseminators for distribution in the area designated by the emergency manager. Residents in this area would then be warned by any combination of these distribution channels.

In simple terms, IPAWS will accept standards-based alert and warning messages generated by emergency managers using existing state, local, tribal, or territorial systems, or an IPAWS web interface. These so called CAP formatted messages will then be forwarded to the FEMA IPAWS aggregator. The aggregator will disseminate the message through all distribution means the emergency manager is authorized to use. For example, the aggregator will have interfaces to distribute messages to traditional broadcast media via the EAS, to cellular devices via the Commercial Mobile Alert System (CMAS) to NOAA Weather Radio, to Internet services via network interfaces, and to unique state and local systems that are IPAWS CAP compliant (such as Emergency Telephone Networks, Radio Broadcast Data Systems, siren, and/or signage systems).

IPAWS will:

- Enhance the resiliency of National-Level EAS through the Primary Entry Point (PEP) expansion program; (PEP stations are the entry points for national presidential EAS alerts that FEMA is responsible for distributing);

- Create an alert and warning message interoperability framework by establishing or adopting standards, such as CAP, that allow a single warning message to be seamlessly transmitted over different systems;
- Improve federal, state, local, tribal, and territorial alert and warning message access to multiple broadcast and other communications pathways by enabling alert and warning messages to reach the public through as many means as possible;
- Partner with NOAA to enable seamless integration of message transmission through the National Weather Service networks;
- Enable alert and warning to those with disabilities and those without proficiency in the English language; and
- Allow the President of the United States to speak to the American people under emergency circumstances.

4.2.2 Current Schedule for 2012

FEMA is on schedule to achieve the IPAWS vision in fiscal year 2012.

1. Interoperable standards and interfaces will be in place;
2. Redundancy will be built into the dissemination network via PBS and public television stations, as directed by the WARN Act; and
3. Integrated disparate message distribution paths will be complete, meaning that one message can travel many paths to reach the American public;

Standards are needed so that federal, state, local, tribal, and territorial entities can share the same common message and interface formats. Inside the IPAWS environment, an aggregator contains a suite of standards and services for message dissemination across multiple systems and platforms. If everyone uses the same standards, validated emergency managers will be able to send their messages over any combination of partner dissemination paths that use those standards. FEMA expects to complete interfaces to many of these dissemination paths in the next two years.

4.2.3 Common Alerting Protocol (CAP)

CAP is an open standard that will benefit emergency managers at all levels by allowing a single warning message to be disseminated simultaneously over many different systems. To increase interoperability in the national warning system, FEMA modified the requirements for an alert profile of the EAS-CAP Industry Group, an industry coalition of emergency alert equipment manufacturers. In December 2008, FEMA submitted these requirements to the Organization for the Advancement of Structured Information Standards (OASIS), an international standards organization. FEMA asked OASIS to develop a product in consultation with its members that reflected public comment. FEMA believed OASIS's open process for development, public vetting, and ultimately advancing an open standard is the best way to ensure a state of the art product.

After meeting with the broadcast industry and receiving their feedback, FEMA pledged to

complete four milestones before adopting the CAP IPAWS profile:

1. Establish a testing program and publish lists of tested, CAP-compliant products broadcasters can purchase;
2. Oversee development of an Implementation Guide for CAP to EAS Translation;
3. Demonstrate delivering a Federal message in the CAP IPAWS Profile format to a National Primary Entry Point Station; and
4. Begin the OASIS process on IPAWS CAP Security Requirements.

Once these four milestones have been reached, FEMA will formally adopt the CAP profile. By federal regulation, broadcasters then have 180 days to make whatever internal changes they deem necessary to be able to receive an IPAWS CAP message.

4.2.4 Geo-Targeted Alert System (GTAS)

FEMA IPAWS is working with NOAA to develop software for state, local, tribal, and territorial emergency managers that will allow real time collaboration with NOAA personnel and weather data for generation of alerts and warnings to specific geo-targeted areas. Called the Geo-Targeted Alert Systems (GTAS), this software models the forward progress of, for example, a chemical cloud or toxic spill, so emergency managers can warn only those people in the anticipated path of the plume. In August 2009, FEMA successfully piloted this software at the City of Dallas Emergency Operations Center, and the NWS Weather Forecast Office in Ft. Worth, Texas. NOAA/NWS and FEMA also conducted live training at the State of Washington EOC and the City of Seattle EOC in 2010.

4.3 Commercial Mobile Alert System (CMAS)

The Commercial Mobile Alert System (CMAS) is required by the 2006 *WARN Act*[2], under

---

[2] Title VI of the *SAFE Port Act*, (PL_109-347) which was signed into law in October 2006, is entitled Commercial Mobile Service Alerts. It is also referred to as the *Warning Alert and Response Network (WARN) Act*, a name derived from the legislation (S.1753) from which it was derived (view prior activity). Among other provisions, the *WARN Act* requires the FCC to adopt:

- System critical protocols and technical requirements for the CMAS;
- A mechanism under which commercial mobile service (CMS) providers may elect to participate in the CMAS and disclose to their subscribers whether or not they will participate;
- Rules under which licensees and permittees of noncommercial educational (NCE) broadcast stations or public broadcast stations install necessary equipment and technologies on, or as part of, any broadcast television digital signal transmitter to enable the distribution of geographically targeted alerts by CMS providers that have elected to participate in the CMAS; and
- Technical testing requirements for CMS providers that elect to transmit emergency alerts and for the devices and equipment used by such providers for transmitting such alerts.

The *WARN Act* also sets out specific benchmarks and deadlines by which the FCC must complete the various requirements mandated. The Commercial Mobile Service Alert Advisory Committee (CMSAAC), also mandated by the *WARN* Act, was given responsibility to develop recommendations on technical standards and protocols to

which Commercial Mobile Service (CMS) providers may elect voluntarily to participate. Please note that CMS is a term defined in the *WARN Act* which is equivalent to Commercial Mobile Radio Services (CMRS), a term used by the FCC to refer to mobile wireless services.
The FCC rules establishing the CMAS require an end-to-end architecture, in which a Federal Alert Aggregator/Gateway would receive, authenticate, and format alerts received by Federal, state, tribal, and local government agencies and then transmit them over a secure interface to gateways administered by participating CMS providers. The CMS providers would, in turn, process the alerts and transmit them to their subscribers' mobile devices.

CMAS is a component of IPAWS systems that will provide the capability to reach cellular phone subscribers with public alert and warning messages and falls under FCC Part 10 rules. FEMA will be the alert aggregator, receiving CAP messages from authorized users and passing alert messages in CMAS format to the cellular phone industry. Adding mobile alerts to the range of distribution channels will eventually cover 270 million subscribers, or 87 percent of the population, as CMAS handsets are introduced into the marketplace. CMAS will facilitate the dissemination of three types of alerts through cell phones: Presidential Alerts; Imminent Threat Alerts; and America's Missing: Broadcast Emergency Response (AMBER) Alerts.

FEMA and DHS' Science & Technology Directorate are working with two industry organizations, the Alliance for Telecommunications Industry Solutions and the Telecommunications Industry Association, and have completed interface specifications between the FEMA CMAS gateway and commercial mobile service provider gateways. This interface will allow federal systems carrying an alert to seamlessly hand off that alert to the private sector commercial mobile carriers in CMAS format for further distribution.

Final balloting by industry association members on the interface specifications was complete in 2009. FEMA formally adopted the resulting CMAS interface specification. By federal regulation under Part 10 rules, cellular service providers have 28 months to make whatever internal changes are necessary to receive an alert and begin to transmit it to their customer base according to their election to participate in CMAS; this 28 month interval ends April, 2012. FEMA and DHS' Science & Technology Directorate also are in the process of completing work on the infrastructure that will allow us to send CMAS alerts to the cellular providers.

For the purposes of this report, CAP is used between alert originators and the FEMA alert aggregator/gateway and this report on CAP introduction may apply to that interface. The interface from the FEMA alert aggregator/gateway is a CMAS-specific protocol format.

5 Analysis, Findings, and Recommendations

As the CSRIC 5A Working Group proceeded with its review of the Part 11 Rules governing EAS, several different themes and concepts emerged and began to take shape. During the Analysis phase, the Working Group members discovered most of their Findings fell into four

---

support the ability of wireless service providers to transmit emergency alerts to their subscribers. The final meeting of this advisory committee was held on October 3, 2007.

major subject areas, including Revisions to the FCC's Part 11 Rules, Citizens with Disabilities, Citizens not Proficient in English, and Defining the CAP Standard. The following section explains the Working Group's Analysis of the four major areas, reveals their Findings, and provides comprehensive Recommendations regarding further exploration or revisions to the Part 11 Rules.

5.1 Revisions to Part 11 Rules

After extensive research and analysis of the FCC's Part 11 Rules, Working Group 5A proposes the following recommended changes.

Subsection	Recommended Change	Explanation/Remarks
§11.1	Update paragraph to include new CAP related alert originators.	Additional originators are tribal, territorial, and Gov't Must Carry.
§11.2(a)	Update PEP definition to be consistent with FEMA implementation and future plans.	
§11.11	Update paragraph to include reference for interface requirements to IPAWS source.	The EAS system is reliant on the IPAWS for EAN originator messages.
§11.11	Consider adoption of ECIG Implementation Guidelines.	Look at what FEMA has adopted and consider whether to adopt the FEMA document or the guideline in the original form.
§11.11(a)	Addition the requirement for receiving and decoding CAP originated messages, also necessitates adding CAP reception in the definition of minimum requirements for EAS Participants. EAS Participants will require the ability to monitor and receive both CAP and legacy EAS protocol messages, and further transmit EAS protocol messages in formats congruent with other Part 11 subsections.	Current 11.11(a) only has a requirement for existing (legacy) EAS equipment, and thus needs to be updated in light of 11.56.
§11.11(a)	"EAS Equipment Requirement" tables need to be revised to reflect the range of new CAP EAS equipment necessary for the monitoring, reception, decoding, and video/audio display of alerts.	Current 11.11(a) only has a requirement for existing (legacy) EAS equipment, and thus needs to be updated in light of 11.56.
§11.13	Is there a need to update EAN relative to	Note for CAP compliance writers

	CAP compliant capability?	
§11.14	Modify PEP paragraph to include reference requiring IPAWS interconnectivity.	
§11.20	"State Relay Networks" should be updated to accommodate the relay of CAP originated messages to EAS participants via the addition of state CAP relay networks.	With the amended monitoring requirements in §11.52, Part 11 rules need to be amended to reflect CAP EAS monitoring within state relay networks. Add information technology to paragraph.
§11.21(a)	Include language on EAN distribution via IPAWS.	IPAWS distribution now augments PEP distribution of EAN.
§11.21(a)	"State and Local Area plans and FCC Mapbook" should be updated to include CAP.	As above
§11.21(b)	"State and Local Area plans and FCC Mapbook" should be updated to include CAP.	As above
§11.31	Clarify how Governor Must Carry messages are to be implemented in EAS Protocol.	E.g., create GOV originator code
§11.32(a)	Modify EAS encoder minimum requirement.	EAS encoder must be capable of rendering a fully CAP compliant message.
§11.32(2)	Modify Inputs	Include requirement for a single Ethernet input with support for multiple IP sources.
§11.33(a)(1)	Add CAP input interface requirements.	Device specifications need to be updated for CAP monitoring, in accordance with 11.52.
§11.33(a)(1)	Add Ethernet input and multiple IP source requirements.	
§11.33(10)	Message validity expanded to include handle duplicate messages and use CAP message by default.	Per the ECIG Implementation Guide
§11.34	Add FCC certification for CAP EAS devices.	IPAWS NIMS conformance testing only provides verification of a project-specific CAP data format, and is therefore necessary for the

DRAFT

		IPAWS project, but not sufficient for the overall CAP-EAS endeavor. The proper CAP-to-EAS translation function is not included in the IPAWS NIMS conformance tests. Therefore, it is necessary that the FCC continue and extend its statutory role in EAS certification to CAP EAS devices.
§11.35(a)	"Equipment operational readiness" – Need to update to include the CAP receiving requirement.	§11.56 requires EAS Participants to receive CAP messages.
§11.44(b)	Modify EAS Participants priority.	Add reference to additional messages from Tribal, Territorial and Gov't Must Carry.
§11.45	Modify Prohibition to reference CAP "Actual" status indicators.	CAP messages of status "Actual" as stated in ECIG.
§11.51(1) and (5,i,1)	Equipment must be capable of rendering a CAP compliant message to EAS.	As opposed to simply generating an EAS code.
§11.51(m)	Add Gubernatorial Must-Carry CAP status.	
§11.51(4) and (5)	Insert "Wireline Video Systems"	Carrier is currently excluded from both paragraphs.
§11.52(a)	"EAS code and Attention Signal Monitoring requirements" – Require CAP receiving equipment.	§11.56 requires EAS Participants to receive CAP messages.
§11.52	A new subparagraph is needed to require EAS participants to monitor multiple IP-based CAP alert sources (i.e. CAP servers), in addition to legacy (audio) EAS alert sources. EAS participants should monitor at least one state and/or local CAP EAS source (i.e. CAP server) in addition to a Federal CAP source.	Monitoring multiple CAP sources is necessary to ensure redundance and support the mandatory Gubernatorial Must-Carry message in §11.55(a).
§11.54(1)	Monitor IPAWS	In addition to the statement of two EAS sources for national alert (EAN).
§11.54	Consider adding (14)	EAS Messages will be broadcast only if the scope of CAP alert is "Public"

DRAFT

§11.55(a)	The mandatory Gubernatorial Must-Carry message requires additional definition.	This provision raises a number of questions, including whether a separate EAS event code may be needed for this function.
§11.56	Consider extending the 180 day clock to 360 days.	The trigger point starting the clock, as well as the length of the clock, need to factor in the following criteria in relation to CAP-based national alerts (EAN): 1. FEMA adoption of CAP. 2. FEMA initiates IPAWS network for EAN dissemination 3. IPAWS conformance testing of devices/systems to be potentially connected to the IPAWS network 4. FCC type certification of any CAP EAS devices mandated for EAS participants. Other factors the commission must consider are how long it will take EAS participants to implement the following: a. Obtaining IP connectivity to receive the CAP EAN b. Equipment procurement, installation, and testing
General Comments	Recommend commission develop a more streamlined method for changing codes to more swiftly enable EAS participants' use of new codes requested by authorities.	Current method of changing and adding event codes is regulatory based and recommend that commission consider modification of the procedure to an administrative process. Reference <eventCode> element specification (4) at line 160 in CAP v1.2 USA IPAWS Profile v1.0.

5.2 Citizens with Disabilities

CAP provides an XML-based data format for exchanging information concerning public warnings and emergencies. CAP provides flexibility for including various text and multimedia based resources which may have applicability to citizens with disabilities.

The National Center for Accessible Media at WGBH[3] Access Alerts project identified gaps that exist between alert systems which deliver information, the unrealized potential of these systems to serve the entire population, and recommended system protocols, technologies and services that can bridge this gap. As part of this gap analysis, the Access Alerts project used consumer and social science research about effective messaging and warning variables for people with

[3] See http://ncam.wgbh.org/invent_build/analog/alerts/

DRAFT

sensory disabilities, as well as a national emergency management survey report on existing and planned practices for accessible emergency notification.

The Access Alerts project concluded with a number of recommendations, some of which have applicability to this analysis:

- Establish relationships with local government's emergency management offices and first responders, and let them know the communications preferences for being notified in an emergency. These relationships help identify the type of information that may be included in the CAP message to support those citizens with disabilities;
- Participate in emergency management drills and planning;
- Participate in voluntary registries for consumer notification, and be sure to understand the registry program's full scope and limitations for what they do – and do not – provide consumers;
- Learn about emergency warning capabilities currently available from existing services provided by NWS systems (e.g. NOAA Weather Radio, NOAA Weather Wire Service (NWWS), and resources on the NWS Web site)[4], and consider the use of Public Alert ™ devices[5] that provide emergency alerting capabilities to people with disabilities;
- Utilize access to the NWS infrastructure currently offered through the HazCollect program[6] to implement more timely and increased local emergency access to currently available NWS emergency warning capabilities;
- Conform to the CAP OASIS standard to ensure interoperability with other systems and equipment;
- Research, acquire, and implement accessible communications resources that are specifically designed to facilitate communication in an emergency between people with sensory disabilities and first responders (e.g., sign language charts, Braille materials, speech-to-text and text-to-speech applications, etc.);
- Produce and maintain a library of fully accessible (text, audio, video) multimedia emergency messages that can be delivered via mobile devices, the Web and broadcast media, shown in shelters, etc. To maximize efficacy, explore cooperative public/private ventures with state agencies and consumer disabilities advocacy organizations that may be working on similar products and services;
- Minimize unnecessary header information in alert messages; and
- Offer consumers as many granular options for subscription opt-in as possible, to combat user fatigue/"cry-wolf" syndrome.

One additional conclusion from this project is the definition of "emergency". The Access Alerts project defined "emergency" as being an "imminent threat to human life or health" and includes

[4] National Weather Service: http://www.nws.noaa.gov/
[5] NOAA Weather Radio consumer information: http://www.nws.noaa.gov/nwr/nwrrcvr.htm
[6] National Weather Service HazCollect program: http://www.nws.noaa.gov/os/hazcollect/

AMBER and other missing-person-at-risk alerts[7]. The definition of "emergency" under EAS is broader.

The National Institute on Disability and Rehabilitation Research (NIDRR) published an Emergency Management Research and People with Disabilities Resource Guide[8] which provides a listing and description of research projects funded by the federal government and non-federal entities, research recommendations that have come out of conferences on emergency management and disability, and a bibliography of relevant research publications. This is a useful source of information for analysis of this issue.

The Telecommunications for the Deaf and Hard of Hearing, Inc. (TDI) filed comments to the FCC's EB Docket No. 04-296, Review of the Emergency Alert System[9]. The comments specifically point out that "(W)hile the Consumer Groups agree that the utilization of the CAP will facilitate the transmission of emergency data, they urge the FCC to not rely solely on that new process".

Specifically, TDI recommended that both audio and video formats are equally important and should contain identical information so that individuals who are deaf, hard of hearing, blind or have visual impairment can receive the same information that is available to people with full visual and hearing capabilities, and it is essential that both formats (audio and video) be required at all times.

Further, TDI recommend that to ensure those with hearing loss have immediate access to accurate and complete information being broadcast in video format in all emergency situations, all parties that are subject to the EAS rules should be required to provide open captions of the audio message in real-time, which would be available for viewing by everyone, and should be required for the display of emergency messages because they can be accessed on a wide variety of devices. These recommendations extend to devices where the screen is less than thirteen inches. They also expressed concern about individuals being able to access the captioning on unfamiliar devices and recommended consumer education.

Based on these analyses, the working group determined the following recommendations:

1. As more people transition from traditional wire line phone systems and TTY usage to Internet-based technologies as their primary means of communication, it is important that these platforms continue to facilitate the delivery of emergency messages to citizens with disabilities. This could be achieved through the development of a national relay center, which disabled individuals could contact to learn more about a local event after receiving an initial alert through traditional channels. Such a center should be a source of information for the deaf and hard of hearing, the blind and visually impaired, caregivers in group homes, and people with physical disabilities; and

[7] This definition is consistent with the FCC's Commercial Mobile Service Alert Advisory Committee (CMSAAC) definition of "emergency".
[8] See http://www.naric.com/nidrr/guide-emergency-management-pwd.pdf
[9] *In the Matters of Review of Emergency Alert System; Independent Spanish Broadcasters Association, the Office of Communication of the United Church of Christ, Inc. and the Minority Media and Telecommunications Council, Petition for Immediate Relief*, Second Report and Order and Further Notice of Proposed Rulemaking, EB Docket No. 04-296 (rel. July 12, 2007) ("FNPRM").

2. Deployment of the CMAS at the local, state, tribal and Federal level using a CAP interface to the Federal Alert Aggregator in the CMAS architecture.

5.3 Citizens not Proficient in English

The multilingual population in the United States is growing in size. According to U.S. Census data, among the 262.4 million people aged 5 and over, 47 million (18%) speak a language other than English at home.[10] In addition, the U.S. Census documented over 300 different single languages and language categories that are spoken in the United States.[11] The Hispanic population in the United States more than doubled between 1980 and 2000.[12] In 2008, Hispanics became the largest minority group in the United States, comprising 15.1% of the population.[13] Spanish continues to be the non-English language most frequently spoken in U.S. homes, with Chinese being second most frequently spoken language.[14] However, an examination of the census data at the state level reveals that the languages and population speaking those languages can vary considerably by locality.[15]

CAP is capable of carrying multiple languages. It allows for the use of multiple information blocks to specify different languages. Including too many languages, however, in an alert message could be problematic because there is a practical limitation to the length of the CAP message. In addition, there is nothing inherent in CAP itself that provides for translation automatically from English to other languages. Moreover, while there is software (or machine-based) language translation technology available, the state of the art is such that the meaning or intent of emergency alert messages may be mis-translated or confused.

Some jurisdictions, such as the State of Florida, have addressed the needs of their multilingual communities by originating emergency messages in English and Spanish (as well as Creole) from their state emergency operations center.

After considering this information, the Working Group finds that there are considerable challenges to adequately addressing the multilingual emergency messaging needs of the changing population. Key among those challenges is the large number of different languages that might need to be accommodated, geographical variances in which languages are spoken as well as the lack of available technology to support effective automated multi-language translation. The Working Group concluded that, at this time, the choice of what language(s) to use in a multilingual EAS message is best determined by the entities in a specific community because only those in that local community know which languages are spoken there.

---

[10] *See* Language Use and English-Speaking Ability: 2000, Issued October 2003 at 1, available at http://www.census.gov/prod/2003pubs/c2kbr-29.pdf, (last visited August 24, 2010).
[11] *Id*. at 2.
[12] *See* Frank Hobbs and Nicole Stoops, U.S. Census Bureau, "Demographic Trends in the 20th Century" (2002) at 1, 78, available at http://www.census.gov/prod/2002pubs/censr-4.pdf (last visited May 12, 2010).
[13] See American Factfinder, U.S. Census Bureau, ACS Demographic and Housing Estimates: 2006-2008, available at http://factfinder.census.gov/servlet/ADPTable?_bm=y&-qr_name=ACS_2008_3YR_G00_DP3YR5&-geo_id=01000US&-gc_url=null&-ds_name=ACS_2008_3YR_G00_&-_lang=en (last visited August 13, 2010).
[14] *Id.*, note 1 at 3.
[15] *See* Table 5. Detailed List of Languages Spoken at Home for the Population 5 Years and Over by State: 2000, available at http://www.census.gov/population/cen2000/phc-t20/tab05.pdf (last visited August 24, 2010).

The Working group has developed the following recommendations.

- Message translation – At this time, the responsibility for message translation should lie with originators of the message. As language translation technology improves, going forward the Commission should:
    - Research methodologies employed by bilingual and multilingual countries (*e.g.* Canada, Israel);
    - Research and determine the accuracy and reliability of machine or software based translation technology. Software language translation may not be sufficiently reliable to be used for emergency messaging;
    - While CAP does support the capability for multiple languages, in many of the alert dissemination methods in use today, the CAP itself is not delivered to an end user device. Research is needed to identify how multi-language information would be delivered to the end user; and
    - Collaborate with industry to develop translation applications with a goal of allowing an end user to select a language translation of choice.
- Use Census data and social science research to identify threshold for recommending non-English language translation services;
- Use Census data to identify geographic areas with high density of non-English speaking population that require translation services; and
- Consistency in messaging – develop and employ a multi-language look-up table for SAME/EAS Event Codes (similar to that developed by NWS and Environment Canada [16]) that would enable automated translation into additional languages directly from the EAS Header Code string contained in an alert message.

5.4 Defining the CAP Standard

Adherence to the CAP standard alone does not guarantee that connected systems and equipment will be conformant with Part 11 Rules for EAS activation and display. This would likely present compatibility and interoperability issues for IPAWS, as well as individual State, local and territorial CAP EAS systems. Below is a general discussion of underlying issues and responses from government and industry.

CAP is a general data format for emergency messaging (all-hazard alerts and warnings). The intent of CAP was to allow a consistent warning message to be disseminated simultaneously over many different warning systems, thus increasing warning effectiveness while simplifying the warning task. As such, CAP serves as a basic container for alert data. However practitioners have increasingly found that additional specificity has been required for the appropriate usage of CAP in various systems, including the EAS.

For this reason, FEMA has issued an IPAWS CAP profile, describing how to use CAP to create

[16] *See* NWS Instruction 10-1712, February 12, 2007 at Appendix A, Section A.4, available at http://www.weather.gov/directives/sym/pd01017012curr.pdf, (last visited August 31, 2010) *See also,* e.g Codes événement des MSSC (Showing French look-up table for SAME codes) avalable at http://www.ec.gc.ca/meteo-weather/default.asp?lang=Fr&n=1C86C296-1(last visited August 31, 2010).

EAS messages, specifically for the FEMA IPAWS system. Industry, via the EAS CAP Industry Group, offers even greater specificity, on how CAP formatted data can be used to construct a Part 11-compliant EAS message, with associated audio and text data. In this manner, guidance is available from the general (the overall CAP format) to the increasingly specific.

5.4.1 IPAWS CAP Profile

The IPAWS CAP Profile is an interpretation of the OASIS CAP v1.2 specification as needed for the purposes of FEMA's IPAWS "system of systems". FEMA is working with the Organization for the Advancement of Structured Information Standards (OASIS) to develop a profile to constrain the CAP Standard for receipt and translation with and among IPAWS system exchange partners. On October 13, 2009, the CAP IPAWS Profile (CAP v1.2 IPAWS Profile v1.0) was approved as an OASIS Committee Specification.

The IPAWS CAP Profile was developed primarily by integrating requirements related to three federal warning-delivery systems:

- The broadcast EAS as recommended by the ECIG;
- The NOAA Non-Weather Emergency Message (NWEM) "HazCollect" program for weather radio and other delivery systems as derived from technical documentation; and,
- CMAS for cellular telephones as described in the recommendations of the Commercial Mobile Service Alert Advisory Committee (CMSAAC).

FEMA's partners in developing the IPAWS CAP Profile included NOAA, FCC, and DHS Science & Technology Directorate.

5.4.2 EAS-CAP Implementation Guide

An EAS-CAP Implementation Guide provides specific details on how a receiving device should interpret CAP formatted data to construct a 47 CFR Part 11 EAS message, and associated audio and text data. In May 2010, the EAS-CAP Industry Group published an Implementation Guide intended to further reduce the areas of uncertainty in how an alert will be presented to the public via CAP/EAS, so that originators and distributors of alerts can deliver the intended message to the public, regardless of the vendors or platforms involved.

The ECIG is a broad coalition of equipment, software and service providers to EAS. ECIG formed in 2008 to present a consolidated voice on key technical, standards and operational issues, from industry's point of view. Current membership represents the vast majority of the EAS industry – hardware, software and systems. All ECIG members have products that utilize CAP v1.1, and several are already supporting both the CAP v1.2 specification and the ECIG Implementation Guide v1.0.

Public warnings intended for transmission over the EAS can be encoded in CAP messages in various ways. As both CAP v1.2 and the CAPv1.2 IPAWS Profile v1.0 make use of several free form text elements and several optional elements, there is ample opportunity for a CAP message rendered by one CAP-to-EAS device to differ when rendered by another vendor's device. There can also be a difference between what the originator intended for an alert, and what alerts

contain, when broadcast by CAP/EAS devices.

This EAS-CAP Implementation Guide was been prepared in light of several points of reference, including the FEMA CAP v1.2 IPAWS Profile v1.0 Requirements, the updated CAP 1.2 specification, and other references. The guide was prepared to facilitate the success of any CAP-to-EAS system including existing and planned state, local, territorial and tribal systems, the proposed IPAWS system, and emerging NWS systems. To that end, in addition to addressing general CAP-to-EAS implementation issues for any advanced EAS system, the Implementation Guide also directly addresses constraints and requirements of the IPAWS program.

The ECIG EAS-CAP Implementation Guide provides specific details on how to send data in a broadcast environment using existing FCC rules, visual and aural standards. The Implementation Guide provides audio standards, text length standards. It also provides hints for originators and software used by originators to allow for the realities of the broadcast environment and existing FCC rules.

6 Conclusion

The CSRIC 5A Working Group spent more than six months researching, analyzing, and evaluating a vast array of ideas, concepts, and themes around the FCC's Part 11 Rules. During this time members participated in dozens of conference calls, consistently accessed and utilized resources posted to their online collaboration portal, and dedicated countless hours editing and revising this Final Report.

Resolving many of the issues covered in the Part 11 Rules proved to be challenging for the diverse membership that made up the 5A Working Group. Certainly a thorough evaluation of the Part 11 Rules was a daunting task, but one that most members found educational and rewarding.

In conclusion, members feel confident that through their diligence and willingness to compromise, this Final Report is a fair and accurate representation of their collective view-points and perspectives. The CSRIC 5A Working Group thanks the FCC for the opportunity to provide feedback and recommendations for proposed changes to the Part 11 Rules and hopes the findings of this Final Report and have a positive influence on future FCC proceedings.

DRAFT