# Report:
# August 11, 2021 Nationwide EAS Test

**December 2021**


**Public Safety and Homeland Security Bureau**

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**Federal Communications Commission • 45 L St. NE • Washington, DC 20554**

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## I. SUMMARY

On August 11, 2021, the Federal Emergency Management Agency (FEMA), in coordination with the Federal Communications Commission (Commission or FCC), conducted a nationwide test of the Emergency Alert System (EAS)[1] using only the broadcast-based distribution system, otherwise known as the "EAS daisy chain." FEMA stated that "[t]he intent of conducting the test in this fashion is to determine the capability of the [EAS] to deliver messages to the public in event that dissemination via internet is not available.[2] This was the sixth EAS nationwide test.[3]

The large majority of the EAS Participants – radio and television stations, cable television systems, direct broadcast satellite (DBS), Satellite Digital Audio Radio Service (SDARS), digital audio broadcasting systems, and wireline video systems – reported successful receipt and retransmission of the nationwide test. The test thus demonstrated that the national EAS distribution architecture is largely effective as designed. As anticipated, the test also shed light on challenges that impeded the ability of some EAS Participants to receive and/or retransmit the test alert. The overall results of the 2021 nationwide EAS test, as determined based upon data collected from the FCC's EAS Test Reporting System (ETRS) and outreach to FEMA and State Emergency Communication Committee (SECC) representatives, demonstrate the following:

- The test message reached 89.3% of the EAS Participants, an increase from 82.5% in the 2019 test. The 2019 test and this year's test both evaluated the broadcast-based architecture. The overall retransmission success rate was 87.1%, which is an increase from 79.8% reported in 2019;
- In this year's EAS test, FEMA and SECC representatives reported that seven Primary Entry Point stations experienced technical complications, down from twelve Primary Entry Point stations that experienced similar complications in 2019;
- Test participants reported roughly half as many complications with receipt and retransmission as compared to 2019.

In this report, the Public Safety and Homeland Security Bureau (PSHSB or the Bureau) provides an analysis of the 2021 nationwide EAS test results, as reported by EAS Participants and other EAS stakeholders. Specifically, the Bureau assesses the functionality of the broadcast-based EAS distribution architecture and identifies areas for improvement regarding technical and operational performance. The report includes steps that the Bureau recommends to improve EAS performance based on this year's test

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[1] *See Public Safety and Homeland Security Bureau Announces Nationwide Test of the Emergency Alert System and Wireless Emergency Alert System on August 11, 2021 and Opens the EAS Test Reporting System for Filings,* Public Notice, 2021 WL 2419820, DA 21-680 (PSHSB 2021). The FCC reported separately on the Wireless Emergency Alert system test results.

[2] *See* Letter from Alfred Kenyon, Chief, Customer Support Branch, IPAWS Program Office, National Continuity Programs, Department of Homeland Security – FEMA, to Marlene H. Dortch, Office of the Secretary, Federal Communications Commission (filed May 3, 2021) (on file in PS Docket Nos. 15-91 and 15-94) https://ecfsapi.fcc.gov/file/10504225138327/FCC%202021%20National%20EAS%20Test%20Date%20Notification.pdf *(FEMA Letter*); see also, *Public Safety and Homeland Security Bureau Announces Nationwide Test of the Emergency Alert System and Wireless Emergency Alert System on August 11, 2021 and Opens the EAS Test Reporting System for Filings,* Public Notice, 2021 WL 2419820, DA 21-680 (PSHSB 2021).

[3] Previous EAS national tests were conducted in November 2011, September 2016, September 2017, October 2018, and August 2019. FEMA did not initiate a 2020 national test due to the COVID-19 pandemic. *See* Press Release, FEMA Cancels 2020 Integrated Public Alert & Warning System National Test Due to COVID-19 Response (June 19, 2020). The FCC also waived the annual EAS Test Reporting System filing requirement. *See FCC Waives 2020 EAS Test Reporting System Filing Requirement,* Order, DA 20-717, 25 FCC Rcd 6765 (PSHSB 2020).

results. Similarly, it recommends actions that EAS Participants can take to improve the reliability and reach of the EAS.

## II. BACKGROUND

The EAS provides the President with a means to address the American public during times of national emergency. It also provides authorized federal, state, and local alert originators an effective means to transmit local and/or statewide emergency alerts,[4] such as severe weather alerts and America's Missing: Broadcast Emergency Response (AMBER) Alerts.[5] The Commission, in conjunction with FEMA, implements the EAS at the federal level.

FCC rules require EAS Participants to have the capability to receive and transmit Presidential Alerts disseminated over the EAS.[6] There are two methods by which EAS alerts may be distributed. Under the traditional broadcast-based distribution structure, the EAS transmits an alert through a pre-established hierarchy of broadcast, cable, and satellite systems, starting with the initial delivery to the Primary Entry Point (PEP) stations.[7] This first method is the EAS Protocol, a messaging protocol that delivers basic alert elements over the air.[8] The EAS Protocol lacks the capability to deliver separate audio and non-English text files and is dependent on radio reception for the quality of the audio,[9] but it serves as a reliable means of disseminating alerts to the public in situations in which IP-based services may not be available.[10] The second method of distribution is over an Internet-based system called the Integrated Public Alert and Warning System or IPAWS. IPAWS alerts are formatted in the more sophisticated Common Alerting Protocol (CAP). CAP-formatted alerts initiated through IPAWS can include audio, video or data files, images, non-English translations of alerts, and links providing detailed information.[11]

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[4] The term "alert originator" refers to a federal, state, territorial, tribal, or local entity authorized by FEMA to use IPAWS to issue critical public alerts and warnings in emergency situations. *See* FEMA, *Alerting Authorities*, https://www.fema.gov/alerting-authorities (last updated Jun. 1, 2021).

[5] The AMBER program is a nationwide alerting program designed to help bring missing children to safety. *See* Office of Justice Programs, *AMBERAlert.gov*, http://www.amberalert.gov/about.htm (last visited Sept. 29, 2021).

[6] *See* 47 CFR §§ 11.2(a), 11.31.

[7] The Appendix includes more information on how the EAS works. The Commission's rules require EAS Participants to be able to receive alerts from both IPAWS and the broadcast-based EAS structure. *See* 47 CFR §§ 11.52(d), 11.56(a).

[8] *See* Appendix, *infra*, at 24. *See also* 47 CFR § 11.31.

[9] The EAS Protocol uses a four-part message for an emergency activation of the EAS. The four parts are: Preamble and EAS Header Codes; audio Attention Signal; message; and Preamble and EAS End Of Message (EOM) Codes. *See* 47 CFR § 11.31. These parts can inform the public as to the nature, location, effective times, and originator of the alert. *See* FCC, PSHSB, Report: September 28, 2016 Nationwide EAS Test at 3 (2016), https://apps.fcc.gov/edocs_public/attachmatch/DOC-344518A1.pdf (discussing the value added from Internet-based alert distribution).

[10] *Review of the 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; Randy Gehman Petition for Rulemaking*, EB Docket No. 04-296, Fifth Report and Order, 27 FCC Rcd 642, 655, para 27 (2012).

[11] EAS Participants can deliver to the public the rich data contained in a CAP-formatted message received directly from the IPAWS Internet feed, but when the alert is rebroadcast over the daisy chain, the CAP data are lost, and EAS Participants receiving the alert over the air cannot transmit CAP-based features, such as digital audio or multiple languages, to the public.

The Appendix to this report contains additional information about the EAS, including a description of how the alerts are disseminated over the EAS.

The Commission places the highest priority on ensuring that emergency managers have effective emergency alerting tools. In this regard, and informed by the 2019 nationwide EAS test results, the Bureau took additional steps to prepare for the 2021 test. Over the past year, for example, the Bureau conducted outreach to promote understanding and compliance with the Commission's accessibility requirements. The Bureau reminded EAS Participants of the importance of ensuring that EAS alerts are accessible to the public.[12] In addition, the FCC Enforcement Bureau issued an Enforcement Advisory to remind EAS Participants of their compliance obligations.[13] Seeking to encourage Low Power broadcaster participation and performance, the Bureau reached out to Low Power broadcasters to share specifically-targeted resources, including an updated Low Power Broadcaster Webinar, that provides instructions and information about how to participate in the test and file in the ETRS.[14] Bureau staff also worked to improve the ETRS user experience by clarifying some instructions, updating the frequently asked questions, improving the search function, and providing more Spanish language filing materials.[15]

## III. THE 2021 NATIONWIDE EAS TEST

### A. The Parameters of the 2021 Nationwide EAS Test

FEMA initiated the 2021 nationwide EAS test by sending a National Periodic Test (NPT) alert to the PEP stations at 2:20 pm on August 11, 2021, for broadcast throughout their listening areas. A group of selected EAS Participants in each PEP's broadcast area, known as Local Primary (LP) stations, monitor these PEP stations. When LP stations receive the NPT alert, they, in turn, broadcast the alert in their listening areas. The remaining broadcasters, cable television facilities, and other EAS Participants located in each LP's broadcast footprint receive the alerts from the LP stations and deliver the alerts to the public (or in the case of cable, to customers' set top boxes). As it did in 2019, FEMA did not distribute the alert through the Internet-based IPAWS system. FEMA conducted the test in this manner to determine the capability of the broadcast-based distribution system to deliver messages to the public in event that alert dissemination via Internet were not available.[16]

[12] *Public Safety and Homeland Security Bureau Reminds EAS Participants and Participating CMS Providers of Requirement to Issue Accessible EAS Alerts*, Public Notice, DA 21-798, 2021 WL 2868282 (PSHSB 2021).

[13] *See Enforcement Bureau Reminds Emergency Alert System (EAS) Participants Of Compliance Obligations,* Enforcement Advisory, DA 21-10, 36 FCC Rcd 44 (EB 2021).

[14] *See Webinar For Low Power Broadcasters on the Emergency Alert System (EAS) and the EAS Test Reporting System (ETRS),* https://www.fcc.gov/file/21330/download (2021 version). *See also Webinar For Low Power Broadcasters on The Emergency Alert System (EAS) and The EAS Test Reporting System,* https://www.fcc.gov/EAS-test-requirements-and-reporting (2019 version).

[15] *See Frequently Asked Questions About the Emergency Alert System Test Reporting System (ETRS), Last updated June 16, 2021*, Public Safety and Homeland Security Bureau, FCC, https://www.fcc.gov/file/21314/download.

[16] *See* Letter from Alfred Kenyon, Chief, Customer Support Branch, IPAWS Program Office, National Continuity Programs, Department of Homeland Security – FEMA, to Marlene H. Dortch, Office of the Secretary, Federal Communications Commission (filed May 5, 2021) (on file in PS Docket Nos. 15-91 and 15-94).

### B. Participation in the Nationwide EAS Test

There are approximately 25,644 EAS Participants in the United States and its territories.[17] This estimate includes analog and digital radio broadcast stations (including AM, FM, and Low Power FM (LPFM) stations); analog and digital television broadcast stations (including Low Power TV (LPTV)); analog and digital cable systems; wireless cable systems; wireline video systems;[18] DBS services; and SDARS.[19]

**Table 1** summarizes the participation rate in the 2021 nationwide EAS test.[20] Excluding duplicate filings,[21] EAS Participants made 19,302 unique filings,[22] with a participation rate of 75.3%, down from 78.6% in 2019.[23] Radio broadcasters had a participation rate of 79.9%, down from 82.0% in 2019, while television broadcasters' participation rate was 62.6%, down from 68.2% in 2019.[24] Cable systems, Internet Protocol Television (IPTV), and wireline video system participants had a participation rate of 67.9%, down from 73.5% in 2019.[25]

[17] This total consists of the 17,521 radio broadcasters and 4,128 television broadcasters in the FCC's Consolidated Database System, and the 3,995 headends active in the FCC's Cable Operations and Licensing System. This methodology likely overestimates the number of radio and television broadcasters that participate in the EAS, as some are exempted from the Commission's rules that govern EAS. For example, if a hub station satisfies the EAS requirements, an analog or digital broadcast satellite station that rebroadcasts 100% of the hub station's programming would not be required to file in the EAS Test Reporting System (ETRS). *See* 47 CFR § 11.11(b).

[18] Wireline video systems are the systems of a wireline common carrier used to provide video programming service. *Id*. at § 11.2(c).

[19] *Id*. at § 11.11.

[20] Throughout this report, data are calculated to the nearest tenth, which, in some instances, results in percentage totals just slightly under or over 100%.

[21] EAS Participants submitted 21,047 filings in 2021. 1,745 of these filings duplicated facilities for which EAS Participants had already filed. The total number of filings include the cumulative tabulation for all forms received from a filer. For example, if a test participant submitted Forms One, Two and Three through ETRS, this would be recorded as one filing, rather than three separate filings.

[22] Unique filings are a set of filings that represent the report of a single EAS Participant facility, such as a radio station or a cable headend, with any duplicate filings removed. Most duplicate filings were submitted for cable systems. To the extent that EAS Participants' filings indicate that a headend serves alerts using multiple, independent sets of EAS equipment, each set of equipment is considered as a unique headend for purposes of this report.

[23] *See 2019 Nationwide EAS Test* at 6. For purposes of this report, participation rate is defined as the number of unique filings received from a specified EAS Participant type divided by the total number of EAS Participants of that type.

[24] *See id*.

[25] *Id.*

**Table 1. Overview of Filings Received in ETRS[26]**

| EAS Participant Type | # of EAS Participants | Filings Received | Unique Filings Received | Filing Rate (Unique Filings) |
|---|---|---|---|---|
| Radio Broadcasters | 17,521 | 14,827 | 13,993 | 79.9% |
| Television Broadcasters | 4,128 | 2,726 | 2,583 | 62.6% |
| Cable Systems | 3,995 | 3,161 | 2,450 | 67.9% |
| IPTV Providers | | 257 | 221 | |
| Wireline Video Systems | | 58 | 40 | |
| Other[24] | n/a | 18 | 15 | n/a |
| ***All Total*** | **25,644** | **21,047** | **19,302** | **75.3%** |

**Table 2** provides an overview of the form types submitted in ETRS. Form One asked EAS Participants to report basic identifying information, such as ownership or licensee contact information, EAS designation as identified in their State EAS Plan, and the make, model, and software version of their EAS equipment. Form Two asked EAS Participants to report "day of test" results, including whether they had successfully received and retransmitted the test alert. Form Three asked EAS Participants to report more detailed test results, such as the first source from which the alert was received, the language in which the alert was received, and details of any issues experienced during the test. 87.8% of test participants completed Forms One, Two, and Three, as required by the Commission's rules, which is down from 90.0% in 2019.[27] 8.9% of test participants submitted "day of test" results in Form Two but failed to submit the detailed results required by Form Three, which is a smaller percentage than 2019's 7.2%. 3.3% of test participants failed to submit any test results, filing only their identifying information required by Form One. Cable Systems had a high Form Three completion rate of 96.5%, while the Other group had the lowest Form Three completion rate of 53.3%.

[26] The Commission has determined that test result data submitted by EAS Participants be treated as presumptively confidential. *See Review of the Emergency Alert* System, EB Docket No. 04-296, Sixth Report and Order, 30 FCC Rcd 6520, 6533, para. 27, note 90 (2015) (noting that test data received from EAS Participants or any reports that contain individual test data shall be treated as presumptively confidential). Accordingly, Table 1 and others in this report reflect aggregated test result data so that no confidential information is revealed. As referenced throughout this Report, PSHSB does not provide data for very small groups of EAS Participants and does not include them among the total number of filings. The omission of this data does not change the assessment of the test in any significant way.

[27] FCC, PSHSB, Report: August 7, 2019 Nationwide EAS Test at 7 (2019), https://docs.fcc.gov/public/attachments/DOC-364279A1.pdf (*2019 Nationwide EAS Test Report*).

**Table 2. Overview of Filings Received in ETRS by Form Type**

| EAS Participant Type | Unique Filings | Form One Filed Only | | Forms One and Two Only | | Forms One, Two, and Three Filed | |
|---|---|---|---|---|---|---|---|
| | | Unique Filings | % | Unique Filings | % | Unique Filings | % |
| Radio Broadcasters | 13,993 | 583 | 4.2% | 1,460 | 10.4% | 11,950 | 85.4% |
| Television Broadcasters | 2,583 | 28 | 1.1% | 181 | 7.0% | 2,374 | 91.9% |
| Cable Systems | 2,450 | 25 | 1.0% | 61 | 2.5% | 2,364 | 96.5% |
| IPTV Providers | 221 | 4 | 1.8% | 9 | 4.1% | 208 | 94.1% |
| Wireline Video Systems | 40 | 0 | 0.0% | 5 | 12.5% | 35 | 87.5% |
| Other | 15 | 1 | 6.7% | 6 | 40.0% | 8 | 53.3% |
| ***All Total*** | **19,302** | **641** | **3.3%** | **1,722** | **8.9%** | **16,940** | **87.8%** |

**Table 3** compares the filing rate of Low Power broadcasters to that of all broadcasters.[28] LPFM participation in the test (49.5%) was lower than that of radio broadcasters overall (78.8%), and lower than 2019's participation rate (55.9%). Similarly, LPTV participation (47.4%) was lower than that of television broadcasters overall (62.7%), and lower than 2019's participation rate (48.1%). As with the 2019 test, the low participation rate of Low Power broadcasters reduced the overall participation rate of broadcasters. Of the 3,734 radio broadcasters that were expected to file but failed to do so, 1,056 (28.3%) were LPFM Broadcasters. Of the 1,509 television broadcasters that were expected to file but failed to do so, 1,045 (69.3%) were LPTV broadcasters.[29]

[28] Tables 3 through 12 exclude EAS Participants that report to be silent, *e.g.* pursuant to a special temporary authorization granted by the Commission. *See also* Table 7, *infra*, at 12 (describing the test results of Low Power participants).

[29] *See also infra* Table 7, at 12 (describing the test results of Low Power participants).

**Table 3. Overview of Filings Received from Broadcasters**

| | Filers Expected | Filings Rec'd[28] | Filing Rate | Form One Filed Only | | Forms One and Two Only | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | # | % | | % | # | % |
| All Radio Broadcasters | 17,637 | 13,903 | 78.8% | 583 | 4.2% | 1,460 | 10.5% | 11,860 | 85.3% |
| LPFM Broadcasters | 2,093 | 1,037 | 49.5% | 83 | 8.0% | 138 | 13.3% | 816 | 78.7% |
| All Television Broadcasters | 4,047 | 2,538 | 62.7% | 28 | 1.1% | 181 | 7.1% | 2,329 | 91.8% |
| LPTV Broadcasters | 1,985 | 940 | 47.4% | 19 | 2.0% | 94 | 10.0% | 827 | 88.0% |

### C. Participants by EAS Designation

ETRS Form One asked EAS Participants to identify the EAS designations assigned to them by their State EAS Plan. **Table 4** provides the reported EAS designations of all test participants by participant type.[30] The number of test participants reporting incorrectly their participant type has increased from 2019. According to FEMA, there are 76 PEP stations nationwide. This year, 531 test participants reported that they served as National Primary (NP) stations. NPs are tasked with the primary responsibility of receiving the Presidential Alert and delivering it to an individual state or portion of a state.[31] In this regard, PEP stations are generally NPs. This number is significantly down from the 624 test participants that reported to be NPs in 2019,[32] and about the same as in 2018, when 539 test participants reported that they served as NP stations.[33] Overall, this data suggests that this number continues to be higher than it should be; test participants need to better understand their role in the EAS and there is still room for improvement in this regard.

[30] For this report, a "test participant" is a unique EAS Participant that completed, at a minimum, ETRS Forms One and Two. Unless otherwise specified, the analyses hereafter only consider filings made by test participants.

[31] 47 CFR § 11.18(a).

[32] *See 2019 Nationwide EAS Test Report* at 8.

[33] *Id*.

**Table 4. EAS Designation by Participant Type[34]**

| EAS Participant Type | National Primary (NP) | State Primary (SP) | State Relay (SR) | Local Primary 1 (LP1) | Local Primary 2 (LP2) | Participating National (PN) |
|---|---|---|---|---|---|---|
| Radio Broadcasters | 353 | 120 | 816 | 1,068 | 722 | 11,109 |
| Television Broadcasters | 87 | 31 | 112 | 104 | 68 | 2,255 |
| Cable Systems | 65 | 16 | 36 | 137 | 66 | 2,247 |
| IPTV Providers | 21 | 1 | 3 | 27 | 8 | 171 |
| Wireline Video Systems | 5 | 0 | 0 | 5 | 2 | 32 |
| Other | 0 | 0 | 3 | 5 | 5 | 5 |
| ***All Total*** | **531** | **168** | **970** | **1,346** | **871** | **15,819** |

[34] Data reflects EAS designations as self-reported in Form One. Many EAS Participants, especially cable systems, marked more than one designation. This chart counts every time the EAS Designation was chosen, so the total number of designations selected exceeds the number of filers.

### D. EAS Participant Monitoring of IPAWS

All EAS Participants are required to monitor IPAWS.[35] ETRS Form One asked EAS Participants to confirm whether their facility's equipment complied with this requirement. **Table 5** shows that 97.4% of test participants reported that they are complying with the IPAWS monitoring requirement—a increase from 96.6% in 2019.[36] However, because the number of test participants decreased, the raw number of participants monitoring IPAWS decreased from 19,349 in 2019 to 18,036 in 2021.[37]

**Table 5. IPAWS Monitoring by Participant Type**

| EAS Participant Type | Test Participants | Monitoring IPAWS | |
|---|---|---|---|
| | | # | % |
| Radio Broadcasters | 13,320 | 12,984 | 97.5% |
| Television Broadcasters | 2,510 | 2,468 | 98.3% |
| Cable Systems | 2,423 | 2,325 | 96.0% |
| IPTV Providers | 217 | 208 | 95.9% |
| Wireline Video System | 40 | 37 | 92.5% |
| Other | 14 | 14 | 100.0% |
| ***All Total*** | **18,524** | **18,036** | **97.4%** |

### E. Breakdown of Test Performance by EAS Participant Type

In ETRS Form Two, the Commission asked EAS Participants whether they had successfully received and retransmitted the test alert on August 11, 2021. **Table 6** shows test participants' success rates for alert receipt and retransmission. When compared to performance during the 2019 test, every category of EAS Participant saw a noticeable improvement. This data indicates that, overall, 89.3% of test participants successfully received the alert which is an increase from the 2019 success rate of 82.5%. The overall retransmission success rate of 87.1% is an increase from 79.8% reported in 2019. 88.8% of radio broadcasters successfully received the alert an increase from 81.6% in 2019, and successful retransmissions improved to 87.0% when compared to the 79.6% success rate in 2019. Television broadcasters reported that 90.1% (up from 85.1% in 2019) successfully received the alert and 86.0% (up from 79.7% in 2019) successfully retransmitted it. Similarly, 90.8% (up from 85.6% in 2019) of cable systems successfully received the alert and 88.7% (up from 81.6% in 2019) successfully retransmitted it.

As we will note later in this report, of the 76 PEP stations operating during this test, seven experienced issues transmitting the test.[38] In 2019, 77 PEP stations were operating and 12 reported experiencing issues with transmission. We believe it is reasonable to infer that these improvements in PEP stations' performance significantly contributed to the marked increases in receipt and retransmission rates. Additionally, as discussed in more detail below, many 2021 PEP complications resulted in low audio rather than total failure to transmit the nationwide test.

[35] 47 CFR § 11.52(d)(2).

[36] *2019 Nationwide EAS Test Report* at 10. Possible explanations for test participants reporting that they do not monitor IPAWS include a lack of broadband access, lack of familiarity with EAS equipment functions, and noncompliance with the Commission's rules.

[37] *2019 Nationwide EAS Test Report* at 10.

[38] *See infra* Section IV.A.3. Monitoring Source Issues at 16.

**Table 6. Test Performance by Participant Type**

| EAS Participant Type | Test Participants | Successfully Received Alert | | Successfully Retransmitted Alert | |
|---|---|---|---|---|---|
| | | # | % | # | % |
| Radio Broadcasters | 13,320 | 11,828 | 88.8% | 11,586 | 87.0% |
| Television Broadcasters | 2,510 | 2,261 | 90.1% | 2,159 | 86.0% |
| Cable Systems | 2,423 | 2,199 | 90.8% | 2,150 | 88.7% |
| IPTV Providers | 217 | 196 | 90.3% | 183 | 84.3% |
| Wireline Video Systems | 40 | 37 | 92.5% | 34 | 85.0% |
| Other | 14 | 14 | 100.0% | 13 | 92.9% |
| ***All Total*** | **18,524** | **16,535** | **89.3%** | **16,126** | **87.1%** |

**Table 7** shows the performance of Low Power broadcasters in the 2021 nationwide EAS test. LPFM broadcasters had an alert receipt success rate of 78.8%, approximately 10 percentage points less than the success rate of all radio broadcasters, and an alert retransmission success rate of 73.3%, approximately 13.5 percentage points less than the success rate of all radio broadcasters. 85.7% of LPTV broadcasters successfully received the alert, which is approximately 4.4 percentage points less than the rate of all television broadcasters. 72.4% of LPTV broadcasters successfully retransmitted the alert, which is approximately 5.4 percentage points less than the rate of all television broadcasters.

**Table 7. Test Results of Low Power Broadcasters**

| EAS Participant Type | Test Participants | Successfully Received Alert | | Successfully Retransmitted Alert | |
|---|---|---|---|---|---|
| | | # | % | # | % |
| All Radio Broadcasters | 13,320 | 11,828 | 88.8% | 11,586 | 87.0% |
| LPFM Broadcasters | 954 | 752 | 78.8% | 701 | 73.5% |
| All Television Broadcasters | 2,510 | 2,261 | 90.1% | 2,159 | 86.0% |
| LPTV Broadcasters | 921 | 789 | 85.7% | 742 | 80.6% |

### F. Language of Alert

Form Three asked EAS Participants to report the languages in which they received and retransmitted the test alert. **Table 8** shows the language of the alerts that were received and retransmitted by test participants. The test alert message was sent only in English. The table below reflects the number

of test participants who elected to transmit the alert to their audience in Spanish.[39] More radio and television broadcasters and cable providers reported receiving and retransmitting the test alert in either Spanish only or both Spanish and English than reported such receipt or retransmission in 2019. The most marked increases were in cable providers that received and retransmitted the test alert in English and Spanish, which were reported by 90 and 131 cable providers, respectively, in 2019, compared to 465 and 508 cable providers, respectively, in 2021.

**Table 8. Spanish Versus English Language Alerts by Participant Type**

| EAS Participant Type | Received Alert | | | Retransmitted Alert | | |
|---|---|---|---|---|---|---|
| | English | Spanish | English and Spanish | English | Spanish | English and Spanish |
| Radio Broadcasters | 10,530 | 39 | 3 | 10,329 | 36 | 8 |
| Television Broadcasters | 2,060 | 23 | 23 | 1,960 | 30 | 38 |
| Cable Systems | 1,678 | 0 | 465 | 1,588 | 0 | 508 |
| IPTV Providers | 183 | 0 | 6 | 174 | 0 | 6 |
| Wireline Video Systems | 33 | 0 | 0 | 33 | 0 | 0 |
| Other | 8 | 0 | 0 | 8 | 0 | 0 |
| ***All Total*** | **14,492** | **62** | **497** | **14,092** | **66** | **560** |

Test participants also reported the primary languages in their service area. **Table 9** tallies the three highest reported service area languages or combination of languages. Of the 14,057 responses received from EAS Participants, 13,334 (94.9%) reported English as the primary language in the service area, while 404 (2.9%) reported both English and Spanish, and 270 (1.9%) reported Spanish only as the primary language in the service area. This year, 16 other languages were reported in smaller numbers, including Russian, Chinese, Korean, Samoan, Navajo, Portuguese, Vietnamese, Greek, Creole, French, Hebrew, Tagalog, Chamorro, Hindi, Yup'ik/Cup'ik, and Hmong.

**Table 9. Primary Language(s) in Service Area**

| English | | English and Spanish | | Spanish | |
|---|---|---|---|---|---|
| # | % | # | % | # | % |
| 13334 | 94.9% | 404 | 2.9% | 270 | 1.9% |

## IV. ANALYSIS OF MOST SIGNIFICANT ISSUES

### A. The Nationwide EAS Test: Complications

Test participants reported complications with the test that included equipment configuration issues, performance issues, audio quality issues, alerting source issues, and clock errors. As in previous years, EAS Participants reported the complications they experienced in two ways. First, ETRS Form

[39] Certain EAS equipment has the capability to generate a text crawl from the header code data provided in the English language EAS message.

Three provided a series of checkboxes that allowed EAS Participants to assign categories to the issues they experienced. These categories were based on the complications observed in previous nationwide EAS tests, which included audio quality issues, equipment performance issues, software update issues, and user error.[40] Second, Form Three allowed EAS Participants to offer more detailed descriptions of the complications through the use of explanatory text fields.

### 1. Complications Reported in Checkboxes

Of the 19,174 test participants, 12,275 reported through checkboxes that they experienced no complications during receipt (64.0%). 13,328 (69.5%) test filers reported they experienced no complications during retransmission. In 2019, 12,510 (62.5%) reported by checkbox that they experienced no complications during receipt, and 13,503 (67.4%) test filers reported the same during retransmission. **Table 10** shows the categories of complications reported by test participants through checkboxes. Of the 18,533 test participants, 2,182 reported through checkboxes that they experienced at least one issue during receipt. 753 test participants reported that they experienced at least one issue during retransmission. In all, participants reported 3,034 issues in receipt and 1,456 issues in retransmission through checkboxes.

**Table 10. Complications Reported by Test Participants Through Checkboxes**

| Complication | Experienced During Receipt | | Experienced During Retransmission | |
|---|---|---|---|---|
| | # | % | # | % |
| Audio Quality Issues | 2,229 | 12.0% | n/a | n/a |
| Equipment Configuration Issues | 87 | 0.5% | 155 | 0.8% |
| Equipment Failure | 39 | 0.2% | 66 | 0.4% |
| Software Outdated | 51 | 0.3% | 48 | 0.3% |
| User Error | 19 | 0.1% | 6 | 0.0% |
| Other | 609 | 3.3% | 1,181 | 6.4% |

### 2. Complications Reported by Test Participants in Explanatory Text Fields

**Table 11a** categorizes the responses received in explanatory text fields for the group of 4,333 test participants that reported they experienced complications in the receipt of the test message. **Table 11b** categorizes the responses received in explanatory text fields for the group of 3,569 test participants that reported they experienced complications in retransmitting the alert.

[40] FCC, PSHSB, Report: September 27, 2017 Nationwide EAS Test at 3 (2017), https://www.fcc.gov/document/report-2017-nationwide-emergency-alert-system-test. *2019 Nationwide EAS Test Report* at 14.

**Table 11a. Explanations Reported by Test Participants Experiencing Complications on Receipt[41]**

| Receipt Explanations | Number of Test Participants Reporting this Explanation | Percentage of Explanations | Percentage of All Unique Filings |
|---|---|---|---|
| Audio Issues | 2,554 | 58.9% | 13.8% |
| Transmission Not Received | 1,027 | 23.7% | 5.5% |
| Equipment Issues | 389 | 9.0% | 2.1% |
| Configuration Issues | 103 | 2.4% | 0.6% |
| Signal issues | 78 | 1.8% | 0.4% |
| Power Issues | 53 | 1.2% | 0.3% |
| Antenna Issues | 48 | 1.1% | 0.3% |
| Clock Issues | 31 | 0.7% | 0.2% |
| Lightning | 26 | 0.6% | 0.1% |
| Out of Broadcast Range | 17 | 0.4% | 0.1% |
| Internet Issues | 7 | 0.2% | 0.0% |
| **Total** | **4,333** | **100.0%** | **23.4%** |

[41] Data reflected in **Tables 11a** and **11b** is based on data reported by test participants in explanatory text fields and does not correlate to the data reported by test participants through checkboxes as reported in **Table 10**. Similarly, the data reported in **Tables 11a** and **11b** is based on data reported by test participants that may not lend itself to one-to-one comparisons. Consequently, there may be variations or differences between the respective data sets.

**Table 11b. Explanations Reported by Test Participants Experiencing Complications on Retransmission**

| Retransmission Explanations | Number of Test Participants Reporting this Explanation | Percentage of Retransmission Explanations | Percentage of All Unique Filings |
|---|---|---|---|
| Audio Issues | 1,506 | 42.2% | 8.1% |
| Transmission Not Received | 1,147 | 32.1% | 6.2% |
| Equipment Issues | 565 | 15.8% | 3.1% |
| Configuration Issues | 94 | 2.6% | 0.5% |
| Power Issues | 64 | 1.8% | 0.4% |
| Clock Issues | 47 | 1.3% | 0.3% |
| Signal Issues | 31 | 0.9% | 0.2% |
| Antenna Issues | 29 | 0.8% | 0.2% |
| Out of Broadcast Range | 29 | 0.8% | 0.2% |
| Lightning | 22 | 0.6% | 0.1% |
| Low Power | 18 | 0.5% | 0.1% |
| Internet Issues | 13 | 0.4% | 0.1% |
| Delivery Issues | 4 | 0.1% | 0.0% |
| **Total** | **3,569** | **100.0%** | **19.5%** |

### 3. Monitoring Source Issues

Below we address two sources of monitoring source issues: PEP station and non-PEP station related complications. Both FEMA and SECC representatives reported that of 76 PEP stations, seven (approximately 9%) experienced technical issues receiving and retransmitting the alert on the test day, a significant decrease from twelve in 2019 (approximately 16%). These parties identified PEP station issues in North Carolina, Michigan, Kentucky, Florida, Virginia, and American Samoa. Premiere Networks, a satellite-based PEP station that is monitored in several states, transmitted no audio.[42] Specifically, three PEP stations relayed low audio; two stations relayed no audio. One PEP station was hit by lightning immediately prior to the test, and another had a communications issue and did not receive the test. PEP stations in Florida and American Samoa experienced similar technical issues in 2019. FEMA notes that it is taking measures to improve PEP performance in the future. In particular, FEMA is continuing its work with SECCs in several states to conduct state-level tests on a monthly basis and station-level tests on a weekly basis through the PEP stations.

Non-PEP station complication reports significantly declined from 2019. Specifically, 1,027 test participants reported in the explanation portion of the form that they did not receive a signal from their monitored source(s). This represents less than half of the 2,533 that reported the same in 2019, and it represents 5.4% of all test participants, compared to 11.1% of all test participants in 2019. In addition, SECC representatives from New Jersey, Pennsylvania, Georgia, Kansas, and Washington informed the

[42] *See* Inside Radio, *FEMA Says National EAS Test Was A Success. But It Wasn't Without Some Hiccups* (Aug. 13, 2021) http://www.insideradio.com/free/fema-says-national-eas-test-was-a-success-but-it-wasn-t-without-some-hiccups/article7df1d848-fbf9-11eb-8f68-ab249836064d.html; Inside Radio, *Despite Success Of National EAS Test, A Clearer Picture Of Hiccups Emerges* (Aug. 24, 2021) http://www.insideradio.com/free/despite-success-of-national-eas-test-a-clearer-picture-of-hiccups-emerges/article_5b4b814e-04ab-11ec-b30f-0b962a9e2d86.html.

FCC of some local broadcast distribution chain issues that were not related to PEP station complications. In New Jersey and Pennsylvania, the issues were specific to one widely monitored source in each state that experienced EAS equipment configuration issues on test day. Each station engineer reports to have fixed the issue. In Georgia, the southern portion of the state relies on intermediary sources like local primaries and state relays to receive the test message. On test day, a state relay experienced a technical issue that disrupted the transmission of the alert to parts of southern Georgia. The Georgia SECC reports that the issue that caused the disruption has been fixed. In Kansas, one widely-monitored EAS Participant first received the alert from Premiere Networks, and as a result retransmitted an alert that lacked audio. This EAS Participant was monitored by 41 other participants, of which 32 reported also retransmitting an alert that lacked audio. In Washington, the SECC reported that several stations in the eastern part of the state received and retransmitted an alert message with low, and, at times, no audio.

**Table 12** shows which test participants, by state, did not receive the alert and explained that this failure was due to monitoring source issues (i.e., not interference, antenna, or equipment issues). While this data does not definitively show that inability to receive a transmission was related to PEP or NP complications, it does show where there were large scale transmission issues. Notably, the states with the highest number of reported monitored source issues were not those that experienced PEP station complications. Although the factors to which we can attribute this discrepancy likely differ from state to state, one case study in Michigan revealed that the failure of a PEP station did not result in large scale reports of failure to receive monitored sources because an alternative monitored source was good quality and the first to arrive at the EAS equipment. In Florida, the PEP station failure did not result in failure to receive the alert; rather it transmitted the alert with audio distortions, which may also have contributed to low numbers of reports of failure to receive the monitored source. Also, alternatives like the public radio relay reportedly worked well this year. Kentucky and Michigan's PEP stations relayed low or distorted audio, which may have limited the number of reports of monitored source complications in those areas.

Illinois experienced the greatest number of reports of monitoring source complications followed by Georgia. In Illinois, the issues were specific to one widely monitored source that experienced equipment configuration issues, which the station reportedly fixed. This single point of failure was compounded by some stations that monitored the same source through their LPs directly and through Illinois' Emergency Management State Relay Network indirectly. Georgia and Pennsylvania's monitoring source issues are described above. In California, many issues were localized to California's Arizona and Nevada border, where it is difficult to receive a signal directly from a PEP station. In addition, there are some areas in California that have difficulty receiving a broadcast signal due to terrain.

**Table 12: Test Alert Receipt Failures Reported in Explanatory Text Fields and Sorted by State/Territory**

| State/Territory | Participants Noting No Test Alert Received | State/Territory | Participants Noting No Test Alert Received |
|---|---|---|---|
| IL | 165 | OH | 12 |
| GA | 106 | OR | 11 |
| PA | 73 | NC | 10 |
| CA | 67 | ND | 10 |
| NY | 43 | KS | 9 |
| WV | 42 | ID | 7 |
| TX | 37 | MT | 7 |
| NJ | 35 | NM | 7 |
| CO | 33 | SC | 7 |
| KY | 31 | UT | 7 |
| AZ | 28 | TN | 6 |
| FL | 26 | NV | 5 |
| AR | 22 | AK | 4 |
| IN | 22 | IA | 4 |
| VA | 22 | MD | 4 |
| WA | 19 | MN | 4 |
| WY | 19 | AS | 3 |
| DE | 17 | MA | 2 |
| LA | 15 | RI | 2 |
| MO | 14 | SD | 2 |
| OK | 14 | CT | 1 |
| WI | 14 | MP | 1 |
| AL | 12 | MS | 1 |
| MI | 12 | NH | 1 |
| NE | 12 | | |
| **Grand Total = 1,027** | | | |

As a practical matter, one way for EAS Participants to reduce complications due to failure to receive the NPT, such as the complications discussed above, is to ensure that they monitor several independent sources of alerts. Multiple monitored sources add redundancy to the system so that when one source fails, a test participant can still successfully receive the alert from elsewhere and retransmit it. We note that the Commission's rules require EAS Participants to monitor two EAS sources for EAS messages that are formatted in accordance with the EAS Protocol, in addition to requiring monitoring of

IPAWS.[43] We are aware that many EAS Participants already monitor multiple broadcast-based sources. However, we continue to emphasize the importance of multiple monitoring sources as required by our rules. We also recommend that stations located far from PEP stations consider the viability, technically and otherwise, of satellite sources of the broadcast alert, such as NPR Squawk Channel, Premiere Networks, and SiriusXM.

#### 4. Equipment Performance Issues

There were 389 test participants that reported equipment performance issues on receipt and 565 on retransmission involving non-working equipment that required returning the equipment to the manufacturer. Participants cited that the equipment simply was out for repair, failed during the test, was missing, or malfunctioned.

#### 5. Poor Signal

There were 78 test participants on receipt and 32 on retransmission that reported failure to receive the test message due to poor signal. Test participants attributed the poor signal to interference, a weak signal from their monitoring source, or a weather-related complication.

#### 6. Antenna Issues

There were 48 test participants on receipt and 29 on retransmission that reported they did not receive the test signal because the antenna failed, fell, was damaged, or was improperly positioned to receive the monitoring source.

#### 7. Equipment Configuration

There were 103 test participants on receipt and 94 on retransmission that provided explanations of EAS equipment configuration issues. Participants in this category cited user-related configuration problems, including the system clock, incorrect tuning, and lack of software upgrades. Most test participants that reported complications related to equipment configuration also reported that they had successfully identified and corrected the cause of those complications or were fixing it immediately.

#### 8. Audio Issues

There were 2,550 test participants on receipt and 1,506 on retransmission that explained their station did not receive the alert due to audio quality complications. Many test participants reported background noise, only tones and no message, and/or unintelligible audio.

#### 9. Power Issues

There were 53 test participants on receipt and 64 on retransmission that explained they were having power outages or issues during the time of the test. Most respondents citing power issues stated these outages were a result of recent storms in the area.

#### 10. Clock Issues

There were 31 test participants on receipt and 47 on retransmission who explained that an incorrect time setting within the EAS equipment caused issues with the ability to receive or retransmit the EAS message. Test participants noted that the time or time zone was set incorrectly. For example, if the EAS equipment's time is set too far ahead, it would not retransmit the EAS message, as the equipment would consider the message to have expired.

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[43] *See supra* note 7.

### 11. Out of Broadcast Range

There were 17 test participants on receipt and 29 on retransmission that explained their station was isolated, or outside of the range other broadcasters. These stations report that they are reliant upon EAS messages sent over the Internet, and because this test was only sent over the air, they did not receive it.[44]

### 12. Lightning

There were 26 test participants on receipt and 22 on retransmission that explained their station was affected by lightening which hindered their ability to received and/or retransmit the test. Lightning issues included damaging equipment necessary for broadcasting or causing interference.

### 13. Internet Issues

There were 7 test participants on receipt and 13 on retransmission that had internet outages during the test. While the test was sent over the air, respondents noted that lack of Internet created an issue with receiving and/or retransmitting the alert. Because FEMA stated it did not transmit this alert via the Internet, these respondents may not have understood the nature of the test and/or did not configure their EAS equipment properly.

### 14. Low Power

There were 18 test participants on retransmissions stated that they were a Low Power station and did not have a responsibility to retransmit. Low power stations are required to broadcast the alert, though they are not required to have equipment capable of generating the EAS codes and Attention Signal.[45]

### 15. Delivery Issues

There were four test participants on retransmission that stated while they did retransmit the test, technical issues caused a failure to occur for some subscribers/viewers, causing the message to not be received.

### 16. Accessibility Issues

Individuals with disabilities and organizations representing people with disabilities submitted observations to the FCC regarding issues relating to the accessibility of alerts. Informal feedback was also obtained from input directly emailed to the Commission. Filers noted that the manner in which the EAS test message was displayed in some cases was not accessible to people with disabilities.[46] Specifically, filers reported that the audio was of poor quality or absent; there was no alert tone; and text crawls were often missing, too fast and unreadable, overlapping with closed captions, or displaying poor color contrast. Overall, the issues raised largely mirrored those identified in the 2019 Nationwide WEA and EAS Test Report.[47]

Because the nationwide test was sent solely in the EAS Protocol, the alert's text and audio messages were not identical in most cases. The EAS Protocol does not relay text or other visual information, so EAS Participants that provide video service (e.g., TV broadcasters or cable providers) are required to construct a visual message from the alert's header codes, which identify the "who, what,

[44] There are several satellite-based sources with a nationwide footprint that deliver EAS alerts in a manner similar to a PEP station. State EAS plans should set forth such sources, e.g., XM Sirius Radio, the National Public Radio Squawk Channel, and Premiere Radio Networks. See 47 CFR 11.21(a)(6).

[45] See 47 CFR 11.51(a), (e) and 11.61(a)(3)(1).

[46] *See* 47 CFR § 11.51.

[47] *2019 Nationwide EAS Test Report* at 19.

where, and when" of the alert.[48] Because the terms used by the video services to add the text and visual information are taken directly from the EAS Protocol, the resulting visual message may be unclear or confusing to the public.[49]

## V. NEXT STEPS

The Bureau will continue to take measures to improve the EAS. To help address areas for improvement highlighted by the 2021 nationwide EAS test, the Bureau will continue to address commonly reported operational complications and improve participation in the nationwide test.

- In December 2021, the Commission initiated a proceeding to improve the accessibility of the visual content for alerts that are distributed via the EAS protocol. Specifically, in the Notice of Proposed Rulemaking, the Commission proposes rule changes to improve the clarity and descriptiveness of the visual message associated with the nationwide EAS test so that members of the public who are unable to access the test's audio message, including persons who are deaf or hard of hearing, will be able to visually receive the critical informational elements of the test in a more understandable manner. In the companion Notice of Inquiry, the Commission examines whether the legacy EAS architecture can be modified, augmented, or redesigned to (i) enable alert originators to relay text of their audio message as part of or in parallel with their legacy EAS alerts so that EAS Participants can generate a more useful visual crawl that matches the information in the audio message, and (ii) enable more functionality within the system as a whole. We encourage parties with an interest in these issues to submit comments in this proceeding in PS Docket 15-94.

- The Bureau will continue to implement user-friendly changes to streamline the ETRS filing process, including exploring how to use state EAS plan data submitted through the Alert Reporting System to further streamline and improve the accuracy of ETRS filings such as by educating EAS Participants of their EAS designations and better ensuring that they monitor their assigned alerting sources.

- The Bureau will work closely with SECCs to help ensure that State EAS Plans, which are required to be updated by July 5, 2022,[50] assign monitoring sources to EAS Participants that ensure EAS redundancy and the best possible coverage for areas that have difficulty receiving broadcast signals.

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[48] *See* 47 CFR § 11.51(d), (g)(3), (h)(3) and (j)(2). The visual message can be formulated as a visual crawl or block text (whereby the text is not scrolled but rather the entire visual message is shown on the screen). Block text typically is employed only by cable systems that force tune subscribers to a given channel wherein the alert audio is played and the visual message is displayed using block text. *See* 47 CFR § 11.51(g)(5), (h)(5). EAS Participants' EAS equipment constructs the visual crawl automatically from the applicable codes – there is no human involvement in this process.

[49] The EAS Participant's call sign also would be included at the end of the text. Because the visual message informational elements for EAS Protocol alerts are fixed, while the audio message is not, the visual crawl and audio message will match only if the alert originator records an audio message that verbalizes only the informational elements used to generate the visual crawl.

[50] *Public Safety and Homeland Security Bureau Announces Deadline for Submitting State Emergency Alert System (EAS) Plans Using the Alert Reporting System (ARS) and Compliance with State EAS Plan Content Requirements and EAS Designations*, PS Docket No. 15-94, Public Notice, DA 21-869 (Jul. 20, 2021) (announcing the launch of the Alert Reporting System, an online database, triggering the July 5, 2022, requirement to file an updated State EAS plan).

- EAS Participants can address some deficiencies with more education, continued training, and improved communication with other broadcasters and their SECC to better understand their role and obligations as a participant in the EAS. Commission rules require regular testing of the EAS.[51] We encourage EAS Participants to use this process to ensure their EAS equipment is in reliable working order, confirm that they are monitoring appropriate sources, and verify that the audio level of the alert is correct. Specifically, it is critically important that those EAS Participants that are widely monitored use testing to ensure their EAS equipment is in reliable working order. EAS Participants that fail to receive an alert or note any issues during a scheduled test should work swiftly and closely with their SECC to identify why and take all necessary steps for corrective action.

## VI. CONCLUSION

The 2021 nationwide EAS test demonstrated an improvement from 2019. Receipt and retransmission rates increased, while reported monitored source complications markedly decreased. As observed in 2019, the system would largely perform as designed, and it would reach the vast majority of the public, if activated without the availability of the Internet. The Bureau will continue to work with FEMA, EAS Participants, and other EAS stakeholders to improve the system and ensure that it remains effective and can transmit timely and accurate national alerts to the public when they are needed the most.

[51] 47 CFR § 11.61(a)(1), (2) (requiring that EAS Participants conduct tests at regular intervals).

## APPENDIX: HOW EAS WORKS

### The Emergency Alert System

The EAS is designed primarily to provide the President with the capability to communicate via a live audio transmission to the public during a national emergency.[52] The EAS is the successor to prior national warning systems Control of Electromagnetic Radiation (CONELRAD), established in 1951; and the Emergency Broadcasting System (EBS), established in 1963.[53] The FCC, in conjunction with FEMA and the NWS, implements EAS at the federal level.[54] The respective roles these agencies play are defined by a 1981 Memorandum of Understanding between FEMA, NWS and the FCC;[55] a 1984 Executive Order;[56] a 1995 Presidential Statement of EAS Requirements;[57] and a 2006 Public Alert and Warning System Executive Order.[58] As a general matter, the Commission and FEMA work closely with radio and television broadcasters, cable providers, and other EAS Participants and stakeholders – including state, local, territorial and tribal governments – to ensure the integrity and utility of the EAS.

FCC rules require EAS Participants to have the capability to receive and transmit Presidential alerts disseminated over the EAS, and generally govern all aspects of EAS participation.[59] EAS Participants also voluntarily transmit thousands of alerts and warnings issued annually by the NWS and state, tribal, and local governments, these alerts typically address severe weather threats, child abductions, and other local emergencies. As discussed in more detail below, non-Presidential EAS alerts do not require that EAS Participants open a live audio feed from the alerting source, but rather transmit alerts with prerecorded messages that can be delivered at the discretion of the EAS Participant, rendering non-Presidential alerts (and their related testing procedures) inappropriate for end-to-end testing of a national alert.[60]

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[52] *See* Review of the Emergency Alert System, *Second Further Notice of Proposed Rulemaking*, 25 FCC Rcd 564, 565, para. 2 (2010).

[53] CONELRAD was not an alerting system *per se* but was rather a Cold War emergency system under which most radio and television transmission would be shut down in case of an enemy missile attack to prevent incoming missiles from homing in on broadcast transmissions. The radio stations that were allowed to remain on the air, the CONELRAD stations, would remain on the air to provide emergency information. *See* "Defense: Sign-off for CONELRAD," *Time Magazine*, Friday, July 12, 1963.

[54] FEMA acts as Executive Agent for the development, operation, and maintenance of the national-level EAS. *See Memorandum*, Presidential Communications with the General Public During Periods of National Emergency, The White House (September 15, 1995) (*1995 Presidential Statement)*.

[55] *See* 1981 State and Local Emergency Broadcasting System (EBS) Memorandum of Understanding among the Federal Emergency Management Agency (FEMA), Federal Communications Commission (FCC), the National Oceanic and Atmospheric Administration (NOAA), and the National Industry Advisory Committee (NIAC), *reprinted as* Appendix K to Partnership for Public Warning Report 2004-1, The Emergency Alert System (EAS): An Assessment.

[56] *See* Assignment of National Security and Emergency Preparedness Telecommunications Function, Exec. Order No. 12472, 49 Fed. Reg. 13471 (1984).

[57] *See 1995 Presidential Statement*.

[58] *See Public Alert and Warning System, Exec. Order No. 13407,* 71 Fed. Reg. 36975 (June 26, 2006) (*Executive Order*).

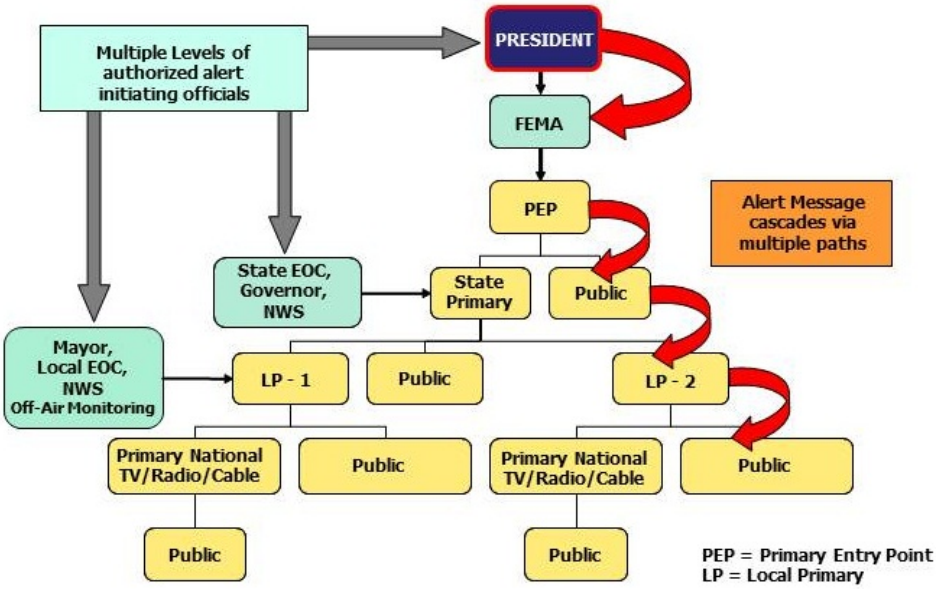
[59] *See* 47 CFR Part 11.

[60] *See 2011 EAS Nationwide Test Report* at 7, n.13.

**Broadcast-Based Distribution of EAS**

There are two methods by which EAS alerts may be distributed. Under the broadcast-based distribution structure, illustrated in Figure 2 below, the EAS is designed to cascade the EAN through a pre-established hierarchy of broadcast, cable, and satellite systems. FEMA initiates a nationwide, Presidential alert using specific encoding equipment to send the EAN code initially to the Primary Entry Point (PEP) stations over a secure telephone (wireline) connection.[61] PEP stations are privately owned commercial and non-commercial radio broadcast stations that cooperatively participate with FEMA to provide emergency alert and warning information to the public before, during, and after a national or local emergency.[62] Upon receipt of the code, the PEPs open a live audio channel to FEMA and broadcast the EAN throughout their listening areas. A group of selected EAS Participants in each PEP's broadcast area, known as Local Primary (LP) stations, monitor these PEP stations. When LP stations receive the EAN, they, in turn, open up an audio channel to FEMA via the PEP, and broadcast the EAN in their listening areas. The remaining broadcasters, cable television facilities and other EAS Participants located in each LP's broadcast footprint receive the alerts from the LP stations, transmit the alerts to the public (or in the case of cable, to customers' set top boxes), and open up the audio channel to FEMA through their PEP and LP.

**Figure 2. EAS Architecture**




[61] The EAN and other EAS codes are part of the Specific Area Message Encoding (SAME) protocol used both for the EAS and NOAA weather radio. *See* National Weather Service, "NOAA Weather Radio All Hazards," *available at* http://www.nws.noaa.gov/nwr/same.htm.

[62] *See* FEMA Fact Sheet, Primary Entry Point (PEP) Stations *available at:* https://www.fema.gov/media-library-data/1409162590527-dc7e1a0996109d271cac4b712e201903/PEP%20Station%20Fact%20Sheet_20140730_508.pdf (last visited May 4, 2020); *see also* information about PEP stations at https://www.fema.gov/national-public-warning-system (last visited May 4, 2020). PEP stations serve as the primary source of initial broadcast for a national alert and are equipped with back-up communications equipment and power generators designed to enable them to continue broadcasting information to the public during and after an event. *Id.*

**Alerting via IPAWS**

EAS and WEA alerts may be distributed over the Internet through the Integrated Public Alert and Warning System (IPAWS), illustrated in Figure 3 below.[63] As of June 30, 2012, EAS Participants are required to be able to receive EAS alerts formatted in Common Alerting Protocol (CAP)[64] from authorized emergency alert initiators over the Internet via IPAWS. CAP-formatted alerts can include audio, video or data files, images, multilingual translations of alerts, and links providing more detailed information than what is contained in the initial alert (such as streaming audio or video).[65] An EAS Participant that receives a CAP-formatted message can utilize the CAP-formatted content to generate messages in synchronous audio and visual formats, which then can be broadcast to local viewers and listeners.[66] CAP also provides each alert with a unique alert identifier and supports alert authentication

[63] FEMA, Integrated Public Alert & Warning System, https://www.fema.gov/integrated-public-alert-warning-system (last visited Dec. 2, 2021).

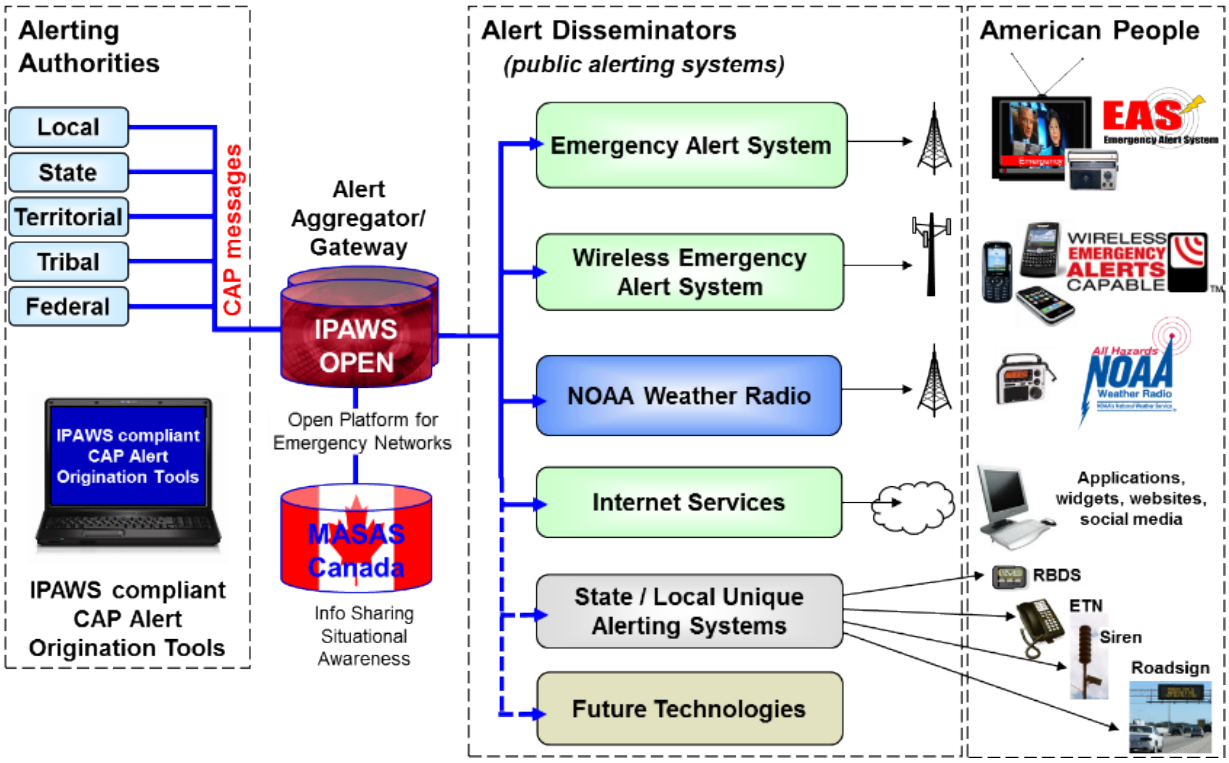
[64] *See Review of the Emergency Alert System; Independent Spanish Broadcasters Association, the Office of Communication of the United Church of Christ, Inc., and the Minority Media and Telecommunications Council, Petition for Immediate Relief; Randy Gehman Petition for Rulemaking*, EB Docket 04-296, Fourth Report and Order, 26 FCC Rcd 13710, 13719, para. 20 (2011) (*Fourth Report and Order*). CAP is an open, interoperable standard developed by the Organization for the Advancement of Structure Information Standards (OASIS), and it incorporates an XML-based language developed and widely used for web documents. *See Review of the 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; Randy Gehman Petition for Rulemaking*, Fifth Report and Order, 27 FCC Rcd 642, 648, para. 10 (2012), *pet. denied in Multicultural Media, Telecom and Internet Council and the League of United Latin American Citizens, Petitioners, v. FCC,* D.C. Cir., 873 F3d 932 (Oct. 17, 2017). CAP messages contain standardized fields that facilitate interoperability between and among devices and are backwards-compatible with the EAS Protocol. *See id.*

[65] *See Review of the 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; Randy Gehman Petition for Rulemaking*, Fifth Report and Order, 27 FCC Rcd 642, 648, para. 10 (2012), *pet. denied in Multicultural Media, Telecom and Internet Council and the League of United Latin American Citizens, Petitioners, v. FCC,* D.C. Cir., 873 F3d 932 (Oct. 17, 2017). Any data contained in a CAP-formatted message beyond the EAS codes and audio message (if present), such as enhanced text or video files, can be utilized locally by the EAS Participant that receives it, but cannot be converted into the EAS Protocol and thus cannot be distributed via the broadcast-based distribution system, as reflected in the part 11 rules. *See e.g.*, 47 CFR § 11.51(d), (g)(3), (h)(3), (j)(2).

[66] *See* 47 CFR § 11.51(d), (g)(3), (j)(2).

through the provision of a digital signature and an encryption field that enables greater protection of the CAP message.[67]

**Figure 3. IPAWS Architecture**




[67] *See* OASIS, Common Alerting Protocol Version 1.2 (2010), *available at* http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2-os.html (last visited Dec. 3, 2021).