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THESIS

**WHOSE RESPONSIBILITY SHOULD IT BE
TO WARN THE PUBLIC ABOUT MISSILE THREATS
TO THE UNITED STATES?**

by

Waylene R. Sangcap

June 2023

Co-Advisors:

Erik J. Dahl
John M. Sheehan

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**WHOSE RESPONSIBILITY SHOULD IT BE TO WARN THE PUBLIC
ABOUT MISSILE THREATS TO THE UNITED STATES?**

Waylene R. Sangcap
Lieutenant, United States Navy
BA, California State University, San Marcos, 2008

Submitted in partial fulfillment of the
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June 2023**

Approved by: Erik J. Dahl
Co-Advisor

John M. Sheehan
Co-Advisor

Afshon P. Ostovar
Associate Chair for Research
Department of National Security Affairs

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ABSTRACT

The United States needs to increase its state of readiness concerning the threat of nuclear attacks, as well as establish an efficient emergency-alert warning system for the release of warning messages to the public, including measures to prevent false alerts. Based on the most recent false ballistic missile alert, which occurred in Hawaii in 2018, it is currently unclear what level of government should warn the public of such threats. The overarching responsibility of such a warning raises the research question, Whose responsibility should it be to warn the public about missile threats to the United States? This thesis applies a qualitative analysis approach to interpret data collected from literature reviews, case studies, and other sources to strengthen the assertion that there is a disconnect among local, state, and federal agencies concerning roles and responsibilities for issuing missile warnings. The research also identifies what current missile threats there are to the United States. Finally, this thesis argues that the federal government should be more directly involved in issuing warnings due to its access to the most current and accurate information and intelligence available.

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|----------|--|
| AA | alerting authorizer |
| AMBER | America’s Missing: Broadcast: Emergency Response |
| CONELRAD | control of electromagnetic radiation |
| DHS | Department of Homeland Security |
| DOD | Department of Defense |
| EAN | emergency alert notification |
| EAS | emergency alert system |
| EBS | Early Broadcasting System |
| FCC | Federal Communications Commission |
| FEMA | Federal Emergency Management Agency |
| GETS | Government Emergency Telecommunications Service |
| HI-EMA | Hawaii Emergency Management Agency |
| IPAWS | Integrated Public Alert and Warning System |
| NOAA | National Oceanic and Atmospheric Administration |
| NORAD | North American Aerospace Defense Command |
| NPR | National Public Radio |
| PACOM | United States Pacific Command |
| WEA | wireless emergency alerts |
| WPS | wireless priority service |

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EXECUTIVE SUMMARY

In recent decades, trust in the warning management system in America has suffered because of several false warning alerts that were issued to the public. A recent incident that contributed to the lack of trust was the 2018 false missile alert incident in Hawaii. On a tropical Saturday morning in January 2018, a false alert warned of an imminent North Korean ballistic missile attack and frightened the Hawaiian populace for over 30 minutes. The false alert led to a great deal of nationwide panic and confusion regarding what level of government (i.e., local, state, or federal) should be responsible for warning the public about such threats.

Some federal officials argue that it should be up to the states to warn their citizens, while some state leaders claim the federal government should be more directly involved. Additionally, state leaders believe that the federal government likely has the best and most accurate emergency warning information. This thesis examines the question of whose overall responsibility it should be to warn the public about missile threats to the United States.

This topic is significant because the United States is facing new and increasing missile threats. It is essential for policymakers to determine who should warn citizens of critical threats and determine how the process to deliver warnings to the public should operate. The threat has become more complex since the Cold War, and U.S. intelligence agencies have observed a rise of ballistic missile threats in recent years.¹ The United States is again coping with the military threats not just from Russia and North Korea but also from China.² Advanced technologies have not only increased threats from ballistic, cruise,

¹ Defense Intelligence Ballistic Missile Analysis Committee [DIBMAC] and National Air and Space Intelligence Center [NASIC], *Ballistic and Cruise Missile Threat* (Washington, DC: DIBMAC and NASIC, 2017), https://www.nasic.af.mil/Portals/19/images/Fact%20Sheet%20Images/2017%20Ballistic%20and%20Cruise%20Missile%20Threat_Final_small.pdf?ver=2017-07-21-083234-343.

² Terrence J. O'Shaughnessy and Peter M. Fealer, *Hardening the Shield: A Credible Deterrent and Capable Defense for North America* (Washington, DC: Wilson Center, 2020), <https://www.wilsoncenter.org/publication/hardening-shield-credible-deterrent-capable-defense-north-america>.

and nuclear missiles, and but recently, serious concerns have emerged with the development of hypersonic weapons. Given the expansion of missile threats, the American public has the right to be aware of how the process for detection and warning of inbound threats is managed. Additionally, the American public should be aware of what measures the warning management agencies (local, state, and federal) are taking to keep the public safe.

The events in Hawaii demonstrate that there are important concerns today about what role the different levels of government should play in warning the American public of threats. Although the United States faced similar questions during the Cold War, there are many more warning systems, including social media, available today than there were then. These new systems present opportunities for warning, but they also introduce new questions, such as which technologies should be used and by whom, and how threats should be determined to be legitimate. It is imperative that citizens be accurately informed on the missile warning process and its reliability. This thesis aims to guide and advance the understanding of this important issue.

The focus of this thesis is based on the single case study of false alert in Hawaii in January 2018 to explore the question of who should be responsible for warning U.S. citizens of an inbound missile attack to the country. It examines this case study in the context of how national alert and warning systems have been used in the United States since the Cold War. Moreover, it reviews different kinds of detection and warning systems used currently to determine what systems appear to be most effective against the threat of missile attack and what level of government is best suited to transmit warnings to states, communities, and individuals.

Chapter I introduces the thesis and provides the literature review, which examines the general problem of warning and assesses the roles of the three levels of government that are capable of warning. Chapter II explores the evolution of public warning systems, including the lessons learned from warning systems used during the Cold War and compares those procedures to the systems in use today. Chapter III presents the case study of the Hawaii false alert incident and reviews the lessons learned after the event. Chapter IV discusses the conflicting roles and responsibilities within the warning

management system among local, state, and federal agencies. Also, it argues how federal agencies appear to be the best suited to be the overall authorizing warning management agency. Lastly, in addition to summarizing the research, Chapter V provides conclusions and recommendations for further study on the safeguards and actions necessary for federal agencies to take charge and be accountable for the process and policies of alerting missile threats to the public.

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I. INTRODUCTION

On the tropical Saturday morning of January 13, 2018, a false alert proclaiming an imminent North Korean ballistic missile attack frightened the Hawaiian populace for over 30 minutes. Moreover, the false alert led to a great deal of nationwide panic and confusion regarding what level of government should be responsible for warning the public about such threats. Some federal officials argue that it should be up to the states to warn their citizens, while some state leaders claim the federal government should be more directly involved in issuing warnings because it usually has the best and most accurate information.

A. RESEARCH QUESTION

This thesis examines the question of whose overall responsibility it should be to warn the public about missile threats to the United States. The Hawaii false alert case study provides context of how national alert and warning systems have been used in the United States since the Cold War. Furthermore, it reviews different kinds of detection and warning systems used currently to determine what systems appear to be most effective against the threat of missile attack and what level of government is best suited to transmit warnings to states, communities, and individuals.

B. SIGNIFICANCE

This thesis topic is significant because the United States is facing increased missile threats to its homeland security. It is essential for policymakers to determine and ultimately codify who is responsible for warning citizens of critical threats and how the process of delivering warnings to the public should operate. U.S. intelligence agencies have observed a rise of ballistic missile threats in recent years.¹ These threats have become more complex

¹ Defense Intelligence Ballistic Missile Analysis Committee [DIBMAC] and National Air and Space Intelligence Center [NASIC], *Ballistic and Cruise Missile Threat* (Washington, DC: DIBMAC and NASIC, 2017), https://www.nasic.af.mil/Portals/19/images/Fact%20Sheet%20Images/2017%20Ballistic%20and%20Cruise%20Missile%20Threat_Final_small.pdf?ver=2017-07-21-083234-343.4.

since the end of the Cold War, and the United States is again considering military threats from not just Russia and North Korea but also from China.²

Threats to America have increased with advanced technologies, such as ballistic missiles, cruise missiles, nuclear missiles, and hypersonic weapons, which have been at the forefront of the latest rise in missile threat concerns. Hypersonic weapons can travel at high speeds in low flight altitudes and have enhanced maneuverability, all of which make them a difficult threat for American defenses to detect and defend against.³ With the increasing advanced technologies in missile threats, members of the American public have the right to be aware of how the process for the detection of warning about inbound threats is managed, as well as what their government is doing to keep them safe.

The events in Hawaii demonstrate that there are important concerns today about what role the different levels of government should play in warning the American public of these threats. The United States faced similar questions during the Cold War, but there are many more warning systems, including social media, available today than there were at that time. These new systems present opportunities for warning, but they also introduce new questions, such as which technologies should be used, how and, by whom and who determines if the threat is legitimate. It is imperative that citizens to be accurately informed about the missile warning process and its reliability. This thesis aims to guide and advance the understanding of this important question.

C. LITERATURE REVIEW

This literature review provides an overview of published research and expert opinion on the question of whose responsibility it is to warn the public of an inbound missile threat to the United States. First, it reviews the literature on the general problems of warning and why they often fail to work. Secondly, it examines existing perspectives of

² Terrence J. O'Shaughnessy and Peter M. Fealer, *Hardening the Shield: A Credible Deterrent & Capable Defense for North America* (Washington, DC: Wilson Center, 2020), 1–6, <https://www.wilsoncenter.org/publication/hardening-shield-credible-deterrent-capable-defense-north-america>.

³ Kelly M. Slayer, *Hypersonic Weapons: Background and Issues for Congress*, CRS report no. R45811 (Washington, DC: Congressional Research Service, 2023), <https://crsreports.congress.gov/product/pdf/R/R45811/34>.

what level of government is best suited to provide warning—federal, state, or local. Lastly, a third section reviews the literature on what the current missile threats are to the United States.

1. The General Problems of Warning

There are several general problems that can limit the effectiveness of warnings to the public about missile threats to the United States. The most common problem of intelligence warning is usually considered to be a *failure to warn*, which has occurred in most cases of major surprise attacks, including the 9/11 attacks and the attack on Pearl Harbor.⁴ However, many scholars have also described the opposite problem of a failure to warn, which is when too many warnings are sent out; this is sometimes called *over-warning*. When over-warning happens and too many messages are sent, the recipients may not take those or future warnings seriously. Erik Dahl, a professor in the Department of National Security Affairs at the Naval Postgraduate School, has written that over-warning appears to have been a factor that led to the bombing of the U.S. Marine barracks in Beirut, Lebanon in 1983.⁵ In that case, there were many alerts and warnings about possible car bombs that eventually led the Marines to become less responsive to the warnings they received about an imminent threat.⁶

Experts have described the problem of over-warning as the issue of false alarms, which can lead to what is called the “cry wolf” syndrome.⁷ For example Arthur Hulnick, an intelligence community veteran of over 35 years, has written, “Warned once, security officials will be quick to take preventative action. But the next time a report surfaces that terrorists are on the way to Boston, local officials may be skeptical”⁸ Furthermore, over-

⁴ Erik J. Dahl, *Intelligence and Surprise Attack: Failure and Success from Pearl Harbor to 9/11 and Beyond* (Washington, DC: Georgetown University Press, 2013), 128–130.

⁵ Erik J. Dahl, “Warning of Terror: Explaining the Failure of Intelligence against Terrorism,” *Journal of Strategic Studies* 28, no. 1 (February 2005): 31–55, DOI: 10.1080/01402390500032005.

⁶ Dahl, “Warning of Terror,” 31–33.

⁷ Arthur S. Hulnick, “Indications and Warning for Homeland Security: Seeking a New Paradigm,” *International Journal of Intelligence and CounterIntelligence* 18, no. 4 (December 2005): 593–608, DOI: 10.1080/08850600500177101.

⁸ Hulnick, “Indications,” 603–604.

warning can cause complacency and lead officials to not verify if a warning is accurate because they automatically assume it is a false alarm.

How to alert the public of missile strikes is a component of a wider issue with agency and leadership structure. To either fail to warn, or possibly over-warn, may cause recipients to lose trust in the alert systems, not only for missile warnings but also for dangerous weather, active shooters, kidnapped children, explosions, and other emergencies.⁹ Michael Rubinkan, of the Associated Press, highlighted an article of weaknesses in the national alert system and concluded that there are many different types of alert systems. Rubinkan interviewed Dan Gonzales, a scientist who studies emergency alert systems at the RAND Graduate School, and Gonzales states about the alert system that, “with so many organizations involved, it’s difficult to make warning foolproof.”¹⁰ Additionally, Gonzales argues that the many agencies and organizations involved in sending out alerts must update protocols to ensure officials release accurate alerts to the public to minimize the chance recipients ignore important information.¹¹

2. The Warning Process

Since the 9/11 attacks, there has been extensive debate over how terrorism warnings and alerts should be transmitted to the American people. The first national alert system was the color-coded Homeland Security Advisory System, which was widely considered to be ineffective.¹² In 2011, the United States implemented the National Terrorism Advisory System to replace an older system, and experts have advised that other communications featuring new technologies, such as the Integrated Public Alert and Warning System (IPAWS), should be used as well.¹³

⁹ Michael Rubinkam, “False Alarms Highlight Weaknesses in National Alert System,” February 10, 2018, *AP News*, <https://apnews.com/article/hawaii-us-news-ap-top-news-weather-ca-state-wire-7f35ad7f72e44d3696b3d63521a5d03e>.

¹⁰ Rubinkam “False Alarms.”

¹¹ Rubinkam.

¹² Jacob N. Shapiro, and Dara Kay Cohen, “Color Bind: Lessons from Failed Homeland Security and Advisory System,” *International Security* 32, no. 2 (2007): 121–154, DOI 10.1162/isec.2007.32.2.121.

¹³ Roy B. Brush, “Silent Warning: Understanding the National Terrorism Advisory System” (master’s thesis, Naval Postgraduate School, 2014), 1–10.

Studies on warnings, especially those that appraise threats from terrorists and other national security dangers, have assumed that the primary role of warning the public should fall to the federal government. This is most likely because federal authorities are expected to have access to much more information and intelligence that leads to warnings than other levels of government would have. Chief engineer for IPAWS Mark Lucero claims, “Federal Emergency Management Agency (FEMA) will tell the states that there’s a missile inbound and where it’s going to land, and then the state will initiate any plans it has in place, one of which being issuing an alert to the public, telling them what to do”¹⁴ However, there is a disconnect among levels of government about which level should provide the warnings to the public, and as of yet, no single focal point has been identified. On the other hand, as *National Public Radio* (NPR) correspondent Martin Kaste pointed out, “Federal officials say it’s not their role to warn the public about missiles”¹⁵

3. Current Missile Threats to the United States

Currently, the United States faces a time when competing countries continue to develop capabilities that challenge and limit the U.S. military advantage.¹⁶ In 2021, the director of the Defense Intelligence Agency, Lieutenant General Scott Berrier, asserted that states and non-state actors are selectively building new military capabilities globally and regionally across a “span of all warfighting domains and cross-geographic boundaries.”¹⁷ Furthermore, he has testified before Congress that these threats “include more lethal ballistic and cruise missiles, growing nuclear stockpiles, and a range of gray zone measures such as ambiguous unconventional forces, foreign proxies, information manipulation, cyberattacks, and economic coercion.”¹⁸

¹⁴ Martin Kaste, “Who Should Warn the Public of Nuclear War?,” *Morning Edition*, NPR, February 12, 2018, 2–3, <https://www.npr.org/2018/02/12/584688294/who-should-warn-the-public-of-nuclear-war>.

¹⁵ Kaste, “Who Should Warn?” 1–2.

¹⁶ *Statement for the Record: Worldwide Threat Assessment Armed Services Committee, U.S. Senate*, (statement of Scott Berrier, U.S. Army, Director, Defense Intelligence Agency), (2021), 1–5, <https://www.armed-services.senate.gov/imo/media/doc/2021%20DIA%20Annual%20Threat%20Assessment%20Statement%20for%20the%20Record.pdf>.

¹⁷ *Statement for the Record* (Berrier), 2.

¹⁸ *Statement for the Record* (Berrier), 2.

Experts note that guided cruise and ballistic missiles have been a leading threat to the U.S. homeland territories and Allied forces overseas due to their significant psychological effects, yet the development of nuclear weapons and nuclear technology still remains a significant threat, as it did throughout the Cold War.¹⁹ The latest serious missile threat to America has been the emergence of hypersonic weapons. Unlike ballistic missiles, which also fly at hypersonic speed, modern hypersonic weapons do not follow a common ballistic trajectory.²⁰ This capability makes them a serious concern to American defense because it allows them to navigate en route to their targets using speed, maneuverability, and low altitude flight, all of which can be challenging to detect and defend against.²¹

Even more than two decades after the end of the Cold War, the large number of nuclear weapons still poses a serious threat to the entire world. There are now an estimated 16,000 nuclear weapons in only nine nations around the world.²² Numerous additional nations, including China, Russia, and North Korea, are thought to be in possession of these kinds of weapons, and experts believe nations with these weapons collectively hold enough to extinguish all of humankind.²³ Even with the Nuclear Non-Proliferation Treaty, the spread of nuclear weapons cannot be stopped by the United States and Russia on their own, and over two decades after the conclusion of the Cold War, the substantial stockpile of nuclear weapons still seems to pose a serious threat to the world.²⁴ To guarantee the safety of the American people, a well-organized public warning system must be put into place.

D. POTENTIAL EXPLANATIONS AND HYPOTHESES

Based on the cumulative research conducted thus far, this thesis hypothesizes that the federal government is best equipped to warn the public of incoming missile threats. The public understanding of the different roles of state and local governments, North American

¹⁹ “The Nuclear Threat: Despite Progress, The Nuclear Threat Is More Complex and Unpredictable Than Ever,” Nuclear Weapons, accessed April 4, 2023, <https://nuclearweapons.info/the-nuclear-threat/>.

²⁰ Slayer, *Hypersonic Weapons*.

²¹ Slayer.

²² Nuclear Weapons, “The Nuclear Threat.”

²³ Nuclear Weapons.

²⁴ Nuclear Weapons.

Aerospace Defense Command (NORAD), and FEMA in detecting and warning threats to the United States is vital. The federal government manages a critical warning system, IPAWS, which can transmit warnings directly from the president to residents via smart devices.²⁵ However, within the federal government, the division of responsibility and the accessibility to the IPAWS system needs further review.

E. RESEARCH DESIGN

This thesis focuses on the single case study of false alert in Hawaii in January 2018 to survey the issue of which agency should be responsible for warning U.S. citizens of an inbound missile attack on the country. It reviews this case study in the context of how national alert and warning systems have been used in the United States since the Cold War and reviews different kinds of detection and warning systems used today to determine what systems appear most effective against the threat of missile attack, and what level of government is best suited to transmit warnings to states, communities, and the public.

F. THESIS OVERVIEW AND DRAFT CHAPTER OUTLINE

Chapter I introduces the thesis and provides the literature review exploring the general problem of warning and assessing the roles of the three levels of government that are capable of warning. Chapter II examines the evolution of public warning systems, the lessons learned from warning systems used during the Cold War, and it compares those procedures to the systems used today. Chapter III presents the case study of the 2018 false alert incident in Hawaii and reviews the lessons learned after the event. Chapter IV probes the conflicting roles and responsibilities in the warning and management system among local, state, and federal agencies. It also argues that federal agencies appear best suited to be the overall authorizing warning management agency. Lastly, Chapter V summarizes the research and provides conclusions and recommendations for further study on the safeguards and actions needed for federal agencies to take charge and be accountable for the process and policies of alerting missile threats to the public.

²⁵ “Integrated Public Alert and Warning System,” Federal Emergency Management Agency, last updated April 6, 2021, <https://www.fema.gov/emergency-managers/practitioners/integrated-public-alert-warning-system>.

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II. HISTORY OF WARNING SYSTEMS

For several decades, the importance of warning early and notifying people of threatening hazards to help them prepare for serious emergencies has been a motivating factor for the development of warning systems.²⁶ In the past, these warning systems were designed to effectively warn the public via a variety of communication systems (such as bells) and to reach as many people at risk as possible in a sufficient amount of time.²⁷ Contemporary warning systems date back to the early 1950s, emerged throughout the Cold War, and are present today. This chapter summarizes the evolution of warning systems, discusses warning systems used since the Cold War, and examines warning systems in use today.

A. EVOLUTION OF WARNING SYSTEMS

It is a human nature for people to want to warn communities immediately in the occasion of natural catastrophes and emergencies.²⁸ Early warning can reduce damages while giving people enough time to execute a plan of escape. In very early civilizations, tribes lit bonfires to signal to others that there was imminent danger, and these fires eventually evolved to audible alarms.²⁹ Through science and technology, the inventions designed to warn as many people as possible have continually changed and evolved over the last few centuries.³⁰ Regardless of the form they took, these warnings comprise a significant part of American history.

During the 1950s, American technology did not yet include the social media applications, which allows users to send messages instantly with the touch of a finger. In

²⁶ Miroslava Malachovska, “History of Early Warning and Emergency Notification Systems,” *Electric Sirens* (Telegrafia blog), November 18, 2020, <http://www.electronic-sirens.com/history-early-warning-emergency-notification-systems/>.

²⁷ “Public Warning System,” Science Direct, accessed May 9, 2023, <https://www.sciencedirect.com/topics/computer-science/public-warning-system>.

²⁸ Malachovska, “History of Early Warning.”

²⁹ Malachovska.

³⁰ Malachovska.

August 1951, authorities established a public warning system known as Control of Electromagnetic Radiation (CONELRAD) to warn the public through amplitude modulation (AM) radio stations. Moreover, the system used specific AM stations that other participating stations would tune into and then, if necessary, initiate a special sequence and procedure to warn citizens.³¹ Endorsed by President Harry S. Truman and established during an era where the United States was on the defense in the event of a Soviet attack, this was considered the first national alerting system.³²

The idea behind CONELRAD was to provide an immediate alert to the public by interrupting normal operations on commercial radio stations. When the interruption occurred, the operator would switch the broadcast to a specific frequency to prevent Soviet bombers from intercepting and using the normal broadcasting frequency as a navigation beacon to home in on their targets.³³ The CONELRAD stations tuned into 604kHz or 1240kHz to broadcast emergency measures to the public.³⁴ These frequencies were marked with a small triangle on the dial to identify them for quick access to the station and the Federal Civil Defense Administration recognized them for use.³⁵

The evolution of Soviet missiles resulted in the obsolescence of CONELRAD system, and in 1963 it was replaced by the Early Broadcast System (EBS). This system was designed as an expedited audio alert method for the president to communicate with the public via radio and television in case of a national emergency.³⁶ EBS provided the president with access to thousands of broadcast stations to deliver urgent messages to the public as well as for alerting at state and local levels.³⁷

³¹ David K. Israel, "A Short History of Emergency Broadcast Systems," Mental Floss, September 8, 2010, <https://www.mentalfloss.com/article/25704/short-history-emergency-broadcast-systems>.

³² "Control of Electronic Radiation CONELRAD: United States Nuclear Forces," Federation of American Scientists, last updated April 29, 1998, 1–2, <https://fas.org/nuke/guide/usa/c3i/conelrad.htm>.

³³ Federation of American Scientists, "Control of Electronic Radiation."

³⁴ Federation of American Scientists, 1–2.

³⁵ Federation of American Scientists.

³⁶ "Emergency Alert System (EAS)," 911 Broadcast, accessed May 13, 2021, http://www.911broadcast.com/tech-emergency_alert_33.htm.

³⁷ 911 Broadcast, "Emergency Alert."

Later, in 1997, coordinated efforts by the Federal Communications Commission (FCC), FEMA, and National Weather Service resulted in the Emergency Alert System (EAS); this allowed the president to speak to the nation with minimal preparation time.³⁸ According to FEMA, EAS messages included the following components: “digitally encoded header, attention signal, audio announcement, and digitally encoded end of message marker.”³⁹ The American public benefited from this enhanced system due to its ability to receive direct messages from the president through all communication broadcasting systems. Additionally, the messages could be released more quickly than with the EBS. The underlying goal of EAS was to immediately release emergency messages to people in need of the information.⁴⁰

Following after EAS, in 2006, a breakthrough in emergency alert technology resulted in the IPAWS, which FEMA endorsed for use within the emergency alert system.⁴¹ This modernized the national alerting and warning infrastructure system, which combined existing public and warning technology systems, provided a larger range of messaging types, and it expanded the available communication pathways. This breakthrough technology increased the ability of the government to alert and warn specific geographic areas of various types of hazards affecting the safety of the public.

B. WARNING SYSTEMS USED DURING THE COLD WAR

Communication and technology were limited and still developing during the Cold War. At the time, concern about nuclear attack on America was common; the idea instilled fear and anxiety in the American public.⁴² Many Americans relied on the government to warn the public utilizing the federal alert system, but the system did not always work as intended.⁴³ On February 20, 1971, a nationwide panic ensued among Americans when a

³⁸ 911 Broadcast.

³⁹ Science Direct, “Public Warning System.”

⁴⁰ 911 Broadcast, “Emergency Alert.”

⁴¹ Science Direct, “Public Warning System.”

⁴² Erin Blakemore, “For 40 Minutes in 1971, It Seemed the End Was Near,” History, October 8, 2018, <https://www.history.com/news/america-was-once-tricked-into-believing-nuclear-war-had-begun>.

⁴³ Blakemore, “For 40 Minutes in 1971.”

testing alert went wrong, and for 40 minutes, they thought they were amid a nuclear war.⁴⁴ The American public was shocked to receive the chilling interrupted broadcast announcements claiming to be a message from the U.S. government. At the time, the public was on edge due to concerns about nuclear weapons and the Vietnam War.⁴⁵ As mentioned earlier, the EBS had been introduced in 1963 for national emergencies, the purpose of the EBS was for national emergencies, and it had the ability to transmit urgent weather and natural disaster updates at the local level.⁴⁶ The National Warning Center inside NORAD had the ability to deliver an emergency alert on a national scale.⁴⁷ Once NORAD received the emergency alert, the EBS would be activated, and the entire nation would be able to hear the president speak within 10 minutes; the system was tested every Saturday.⁴⁸

In 1971, against the backdrop of the high anxiety brought on by the Vietnam war, there was an incident that appeared to be a real alert. Initially, the incident resulted in confusion and angst of the American public. The message was authenticated by the use of the proper daily code words “Hatefulness, Hatefulness” and read, “This is an emergency action notification (EAN) directed by the president. Normal broadcasting will cease immediately.”⁴⁹ All broadcasting went to a halt as the announcers read the “federally mandated script” and told audiences that their regular programs would be interrupted at the government’s request.⁵⁰

During this time, the Vietnam War was still ongoing and the American public’s top fear was that of a communist battle resulting in a nuclear war.⁵¹ Americans were extremely concerned and confused, while state and local authorities demanded the Pentagon explain the emergency warning announcement on the EBS.⁵² Soon after, the warning center

⁴⁴ 911 Broadcast, “Emergency Alert.”

⁴⁵ 911 Broadcast.

⁴⁶ Blakemore, “For 40 Minutes in 1971.”

⁴⁷ Blakemore.

⁴⁸ Blakemore.

⁴⁹ Blakemore, 2–3.

⁵⁰ Blakemore.

⁵¹ Blakemore.

⁵² Blakemore.

realized that the EBS message was a false warning alert, and the workers at the warning center frantically searched for the code word to cease the broadcasting.⁵³ After 40 minutes of unsuccessful attempts to locate that code word, the Office of Civil Defense, which served as a liaison between local, state, and federal government defense councils, finally sent a correction message with the proper code word to media organizations in order to secure and resume daily intended broadcasting.⁵⁴

The Office of Civil Defense later explained that it was an operator error, and the wrong tape was erroneously submitted to radio broadcasters around the nation.⁵⁵ Having been fearful for their lives and the lives of their loved ones during a supposed nuclear attack on their nation, the members of the public were angry. Despite this, the EBS was the nation's first line of a communication system that could be a useful warning system—when operated properly. As a result, officials altered the testing operations and created a unique test language that radio stations could alter into song form, which was most likely to put the public more at ease during testing.⁵⁶

Then in 1997 the Emergency Alert System (EAS) replaced the EBS, and as noted in the previous section, in 2006 the IPAWS was created to augment the EAS. In early October 2018, FEMA and the FCC scheduled its first test of the new systems to transmit a "presidential alert," which was an alert sent to every compatible mobile phone in the country.⁵⁷ The previously used EBS and upgraded EAS types of alerts were unique alerts utilized by the president to enhance public safety, and were sent during national emergencies. The upgraded EAS alert is considered to be a special class of warning alerts through its breakthrough wireless technology for the president to use during immediate public emergency alerting and will continue to evolve over time.

⁵³ Blakemore.

⁵⁴ Blakemore.

⁵⁵ Blakemore.

⁵⁶ Blakemore.

⁵⁷ "Nationwide Emergency Alert Test Planned for Oct. 3; Test Messages Will be Sent to Cell Phones, TV and Radio," U.S. Department of Homeland Security, last accessed June 28, 2022, <https://www.dhs.gov/news/2018/10/02/nationwide-emergency-alert-test-planned-oct-3>

C. WARNING SYSTEMS IN USE TODAY

The era Americans live in today is one in which the United States is in constant competition with nations seeking to expand their capabilities to contest, limit, and exceed the U.S. military advantages. As demonstrated through the Nuclear Non-Proliferation Treaty, in force since 1970, the reduction in the threat from nuclear weapons has been a strategic goal of the United States.⁵⁸ As previously mentioned, there are more than 16,000 nuclear weapons distributed among nine different countries, not all of which have the best interests of America in mind.⁵⁹

Given the number of nuclear weapons available for use and terrorist threats, the United States must remain vigilant. The United States must also continue to evolve its own technology while also ensuring it has an efficient defense and a warning system with which to alert the public in the event of a missile or nuclear threat, as well as innovative methods to mitigate false alerts.

IPAWS is used by 1,500 federal, state, municipal, and territorial warning authorities to distribute critical public and warning alerts within their domains.⁶⁰ According to FEMA, “An Alerting Authority is a jurisdiction with designated authority to alert and warn the public when there is an impending natural or human-made disaster, threat, or dangerous or missing person.”⁶¹ The practice of an alerting authority includes an individual at a computer screen who composes and creates and sends out emergency messages using IPAWS in line with the plans, rules, and procedures.⁶²

According to FEMA, the idea behind IPAWS “is that “it is how it allows alerting authorities to deliver alerts simultaneously through multiple communication pathways to

⁵⁸ Nuclear Weapons, “The Nuclear Threat.”

⁵⁹ Nuclear Weapons.

⁶⁰ “Alerting Authorities,” Federal Emergency Management Agency, last updated April 6, 2021, <https://www.fema.gov/emergency-managers/practitioners/integrated-public-alert-warning-system/public-safety-officials/alerting-authorities>.

⁶¹ Federal Emergency Management Agency, “Alerting Authorities.”

⁶² Federal Emergency Management Agency.

reach as many people as possible.”⁶³ This system is an upgraded public warning system; however, it is not a replacement for the alerting methods such as the EAS, which are already active for use. IPAWS offers additional capabilities and compliments the currently used alerting methods.⁶⁴ It costs nothing to send messages; however, IPAWS must have an alert origination software that is compatible with local system specifications to communicate with other warning communication systems.⁶⁵

Figure 1 illustrates how IPAWS sends alerts. This unique system allows the designated alerting authorities to send their own alerts and warn the public of a disaster, threat, and even child abductions.⁶⁶ The message must be sent with a compliant software called Common Alerting Protocol.⁶⁷ It is then forwarded to the IPAWS, which authenticates the message and simultaneously delivers it to multiple communication pathways, including the EAS, Wireless Emergency Alerts (WEA), National Oceanic and Atmospheric Administration (NOAA) Weather Radio, internet based services, and unique future technologies.⁶⁸ Once a message filters through the IPAWS pathway, it goes out to reach those at risk to prevent greater damages and increase human safety.⁶⁹

⁶³ Federal Emergency Management Agency.

⁶⁴ Federal Emergency Management Agency.

⁶⁵ Federal Emergency Management Agency.

⁶⁶ Federal Emergency Management Agency.

⁶⁷ Federal Emergency Management Agency.

⁶⁸ Federal Emergency Management Agency.

⁶⁹ Federal Emergency Management Agency.

State, Territorial, Tribal, Local - Level

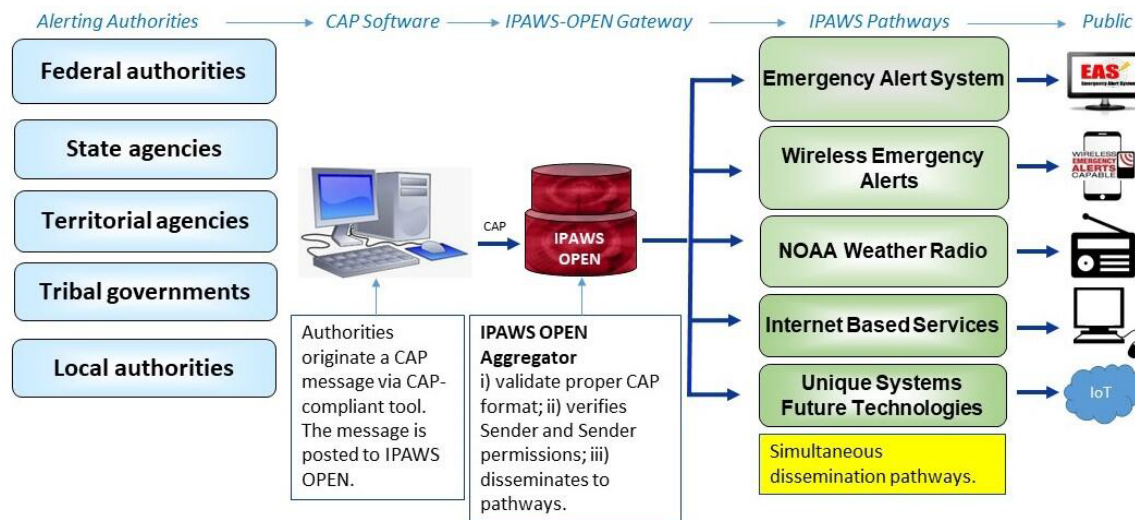


Figure 1. Integrated Public Alerting and Warning System Flow Chart⁷⁰

There are a variety of WEA messages that government entities use today. According to FEMA, WEA messages have five different types of alerting methods, which include presidential alerts, imminent threat alerts, public safety alerts, America’s Missing: Broadcast Emergency Response (AMBER) alerts, and opt-in test messages.⁷¹ These types of alerts can be triggered and issued to the public during a national emergency, extreme weather conditions, and for child abductions in a local area.⁷² Presidential alerts are unique and are sent during a national emergency.⁷³ Imminent threat alerts are threatening emergencies that have happened or are ongoing.⁷⁴ Public safety alerts provide threat information and public safety announcements, while AMBER alerts are messages about urgent child abduction cases sent out to nearby communities in effort to search for, save,

⁷⁰ Source: Federal Emergency Management Agency, “Integrated Public Alert.”

⁷¹ “Wireless Emergency Alerts,” Federal Emergency Management Agency, last updated August 6, 2020, <https://www.fema.gov/emergency-managers/practitioners/integrated-public-alert-warning-system/public/wireless-emergency-alerts>.

⁷² Federal Emergency Management Agency, “Wireless Emergency Alert.”

⁷³ Federal Emergency Management Agency,

⁷⁴ Federal Emergency Management Agency.

and recover a missing child. additionally, AMBER alerts have opt-in test messages that measure the capabilities of state and local WEA messages for testing purposes.⁷⁵

When the president needs to reach the American people during a national emergency, the EAS utilizes radio and TV broadcasting to transmit important messages within 10 minutes.⁷⁶ Moreover, state, local, and territorial authorities work closely together with broadcast, cable, and satellite operators to ensure the president’s message is pushed through the networks. As FEMA explains, “FEMA, in partnership with the FCC and NOAA, is responsible for implementing, maintaining and operating the EAS at the federal level.”⁷⁷ IPAWS is a system used under the direction of FEMA employees, and the EAS is a communication pathway within IPAWS that includes benefits such as the ability to interrupt radio and television broadcasting, to cover a large geographic area, and to display messages full screen with audio attachments; it also can transmit messages in languages other than English.⁷⁸

The evolution of the general public warning systems has significantly improved over the last few decades. Urgent messages are easily pushed out to the public via wireless alert warning systems, and, during a national emergency, the president is able to have timely, direct contact with members of the public who possess smart devices. While public warning methods have evolved, less work has been done to examine the distribution of roles and responsibilities concerning warning among local, state, and federal government entities. Over the past decades, the federal government has delegated to state and local agencies the overall responsibility of overseeing authorization and cancellation these warnings to the public.

An example of the federal government delegating its overall responsibilities of warning occurred during the false missile alert in Hawaii in January of 2018. A Hawaii

⁷⁵ Federal Emergency Management Agency.

⁷⁶ “Emergency Alert System,” Federal Emergency Management Agency, last updated August 6, 2020, <https://www.fema.gov/emergency-managers/practitioners/integrated-public-alert-warning-system/public/emergency-alert-system>.

⁷⁷ Federal Emergency Management Agency, “Emergency Alert System.”

⁷⁸ Federal Emergency Management Agency.

Emergency Management Agency (HI-EMA) employee sent out mass text message warning the Hawaiian public to seek safe shelter due to an inbound missile.⁷⁹ An unnecessary amount of time then passed before HI-EMA successfully notified the public that it was a false alert; this left the residents and tourists of Hawaii in distress and led to an increase in mistrust of U.S. warning systems.⁸⁰ Since then, the structure of who oversees early warning protocols has been a topic of discussion, and clear identification of the roles and responsibilities, which authorities have yet to achieve, would indeed help to put the public more at ease and increase trust in the warning systems.

This chapter has delved into the evolution of public warning systems from CONELRAD to IPAWS. It also reviewed the lessons learned from warning systems, including EBS, in use during the Cold War and the upgrade to the EAN warning systems. The evolution of warning systems and procedures used today include the IPAWS and has expanded the alert warning system capability to the WEA, which can issue presidential, imminent threat, and AMBER alerts. The general warning systems have significantly improved over the last few centuries and past events of false warnings has put the local, state, and federal agencies responsible on notice to ensure continued research and developments of improvements in public warning systems.

⁷⁹ Federal Communication Commission, *Report and Recommendations, Hawaii Emergency Management Agency January 13, 2018 False Alert* (Washington, DC: Federal Communication Commission, 2018), <https://docs.fcc.gov/public/attachments/DOC-350119A1.pdf>.

⁸⁰ Federal Communication Commission, *Report and Recommendations*.

III. CASE STUDY: THE HAWAII FALSE MISSILE ALERT

In the past few decades, America’s evolving public alert system has provided opportunity of further study and analysis into how the public has been alerted regarding major events. The IPAWS system has the capability of pushing warning alerts to the public instantly via EAS, WEA, and cell phones. This has brought the citizens some peace of mind in the event of a major disaster. Unfortunately, in Hawaii, a false missile alert occurred due to several preventable factors, and accordingly, what should have been a routine drill turned into statewide panic. This chapter presents a summary and analysis of the case study of the 2018 false missile alert incident that took place in Hawaii, including the events leading up to the incident, the day of the false alert mishap, an explanation of what went wrong during the incident, and lessons learned to examine what measures have been taken to mitigate such false alerts.

A. LEADING UP TO THE FALSE ALERT INCIDENT

Due to its unique geographical setting, the state of Hawaii is particularly vulnerable to natural disasters.⁸¹ Numerous destructive disasters that have struck the islands include hurricanes, tropical storms, earthquakes, and tsunamis. These disasters have led the state of Hawaii to formulate a capabilities-based approach to train warning operators and exercise a wide range of mitigation and prevention.⁸² HI-EMA has been dedicated in the efforts of coordinating, planning, training, and exercising overall proficiency in executing the 32 “core capabilities” as defined in the 2015 *National Preparedness Goal*.⁸³ This has played a critical role in the process of strengthening Hawaii’s emergency warning strategies in managing, validating, and improving new capabilities to achieve an all-hazards approach through emergency preparedness and response.⁸⁴

⁸¹ Hawaii Emergency Management Agency, *Multi-year Training and Exercise Plan 2017–2019*, rev (Honolulu: Hawaii Emergency Management Agency, 2018), https://dod.hawaii.gov/hiema/files/2018/01/HI-EMA-Training-and-Exercise-Plan-2018.FINAL1_.pdf.

⁸² Hawaii Emergency Management Agency, *Multi-year Training*.

⁸³ Hawaii Emergency Management Agency.

⁸⁴ Hawaii Emergency Management Agency.

According to the HI-EMA, in April 2017, in response to the rising geopolitical tensions brought on by North Korea's ballistic missile threats against the United States, HI-EMA launched a ballistic missile readiness campaign.⁸⁵ Then in October 2017, the Multi-Year Training and Exercise Planning Workshop was a stakeholder statewide effort for planning, training, and exercise that was managed by HI-EMA.⁸⁶

Formed by HI-EMA when it initiated the robust public outreach campaign, the Ballistic Missile Preparedness Phase I effort was an improved preparedness capabilities program for Hawaii.⁸⁷ Expectations had been high for a re-evaluated public warning system controlled by HI-EMA.⁸⁸ In December 2017, U.S. President Donald Trump and North Korean leader Kim Jong-un had been speaking about nuclear threats.⁸⁹ Unfortunately, a few months after the exchange between the leaders, the January 13, 2018 false missile alert incident in Hawaii occurred, and clearly the outreach preparedness campaign experienced little success.⁹⁰

The public expected HI-EMA to prevent, reduce vulnerability to, and provide guidance in response to major disasters with multitier community support.⁹¹ As a result of high tensions between the United States and North Korea leading up to the 2018 Hawaii false alert incident, concerns of Hawaii's preparedness plans had increased. The concerns motivated Hawaii to increase its preparations with the idea that the alert systems could quickly inform residents of possible inbound ballistic missile threats.⁹² Traversing an arc of approximately 5,700 miles, a missile launched from North Korea is estimated to take a

⁸⁵ Hawaii Emergency Management Agency.

⁸⁶ Hawaii Emergency Management Agency.

⁸⁷ Hawaii Emergency Management Agency.

⁸⁸ State of Hawaii Department of Defense, *All-Hazards Preparedness*.

⁸⁹ Adam Nagourney, David E. Sanger, and Johanna Barr, "Hawaii Panics After Alert About Incoming Missile Is Sent in Error," *New York Times*, January 13, 2018, <https://www.nytimes.com/2018/01/13/us/hawaii-missile.html>.

⁹⁰ State of Hawaii Department of Defense, *All-Hazards Preparedness*.

⁹¹ State of Hawaii Department of Defense.

⁹² State of Hawaii Department of Defense.

little more than half an hour to hit Hawaii.⁹³ State officials claim that during such an event, residents would have no more than 12 minutes to seek shelter as soon as an alert is received.⁹⁴

B. THE DAY OF THE FALSE ALERT INCIDENT

It was an extraordinary Hawaiian day for most locals and tourists on January 13, 2018, when people received an unexpected and shocking emergency alert on their mobile devices.⁹⁵ The Hawaiian residents and tourists took the alert very seriously given the rising tensions between United States and North Korea at that time.⁹⁶

Nearly a million individuals were concerned a ballistic missile attack would occur after a HI-EMA employee sent a statewide wireless emergency alert employee via text message that read, “BALLISTIC MISSILE THREAT INBOUND TO HAWAII. SEEK IMMEDIATE SHELTER. THIS IS NOT A DRILL.”⁹⁷ Figure 2 shows the wireless emergency alert sent out to the population. After more than 30 minutes, Hawaiian officials finally sent out another wireless emergency alert to confirm that the alarm was a false alert and that there was no actual threat to Hawaii (see Figure 3).⁹⁸

⁹³ Nagourney, Sanger, and Barr, “Hawaii Panics.”

⁹⁴ Nagourney, Sanger, and Barr.

⁹⁵ Sara Sidner, and Dakin Andone, “What Went Wrong with Hawaii’s False Emergency Alert,” CNN, January 15, 2018, <https://www.cnn.com/2018/01/14/us/hawaii-false-alarm-explanation/index.html>.

⁹⁶ Nagourney, Sanger, and Barr, “Hawaii Panics.”

⁹⁷ Carla Herreria Russo, Sara Boboltz, and Chris D’Angelo, “For 38 Minutes, Hawaii Panicked: ‘This Could Be The End,’” *Huffington Post*, January 13, 2018, https://www.huffpost.com/entry/hawaii-reaction-false-missile-alert_n_5a5a7329e4b03c4189662b37.

⁹⁸ Russo, Boboltz, and D’Angelo, “For 38 Minutes.”

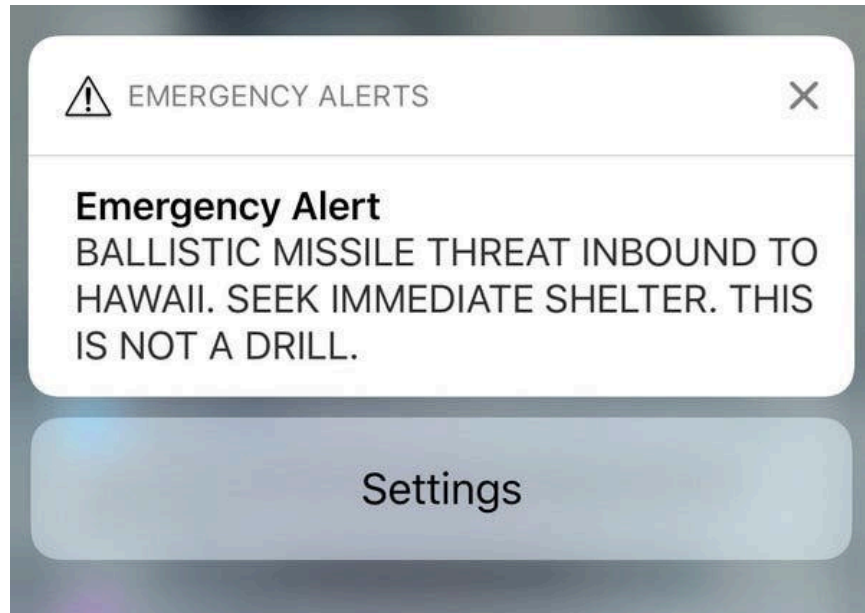


Figure 2. An Image of the Alert Sent to Cellphones on Saturday Morning⁹⁹



Figure 3. An Electronic Sign Reading “Missile Alert in Error: There is No Threat” on a Highway in Hawaii¹⁰⁰

⁹⁹ Source: Nagourney, Sanger, and Barr, “Hawaii Panics.”

¹⁰⁰ Source: Nagourney, Sanger, and Barr, “Hawaii Panics.”

This false alert terrified the public and reminded many of the similar warning message during the surprise air raid on Pearl Harbor on December 7, 1941.¹⁰¹ Not even a century had passed since the attack on Pearl Harbor and the familiar phrase “This is not a drill” was again sent out in Hawaii on January 13, 2018.¹⁰² The false alert forced many to seek shelter; Hawaiian residents and tourists alike were later outraged to find out the alert was due to human error, and they questioned why so much time passed before the alert was confirmed to be false.¹⁰³

The incident occurred when HI-EMA’s Warning Point activated the statewide Civil Danger Warning ballistic missile alert through FEMA’s IPAWS system, which notified the public instantly via WEA, EAS, and broadcasting stations.¹⁰⁴ Over 30 minutes of significant time passed for the initial warning alert’s distribution by the warning systems, and it left both the state officials and citizens confused as to what was actually happening.¹⁰⁵ Moreover, the public was outraged as to why the HI-EMA mistakenly sent out the alert and then took over 30 minutes to announce to the public and secure from the false alert.¹⁰⁶

Hawaiian officials claimed a state emergency management worker inadvertently pushed the wrong button, which sent out a false alert throughout Hawaii.¹⁰⁷ The *New York Times* reported, “Officials said the alert was the result of human error and not the work of hackers or a foreign government.”¹⁰⁸ The *All-Hazards Preparedness Improvement Action Plan and Report* stated the reason for the delay was that “HI-EMA staff had to create an event code to distribute the follow-on false alert message during the confusion that

¹⁰¹ “Today in History: December 7, Air Raid on Pearl Harbor,” Library of Congress, accessed March 28, 2023, <https://www.loc.gov/item/today-in-history/december-07/>.

¹⁰² Federal Communication Commission, *Report and Recommendations*.

¹⁰³ W. J. Hennigan, “Hawaii’s False Alarm Exposes U.S. Civil Defense Gaps,” *Time*, January 18, 2018, <https://time.com/5107487/hawaii-false-alarm-exposes-us-civil-defense-gaps/>.

¹⁰⁴ State of Hawaii Department of Defense, *All-Hazards Preparedness*.

¹⁰⁵ State of Hawaii Department of Defense.

¹⁰⁶ Nagourney, Sanger, and Barr, “Hawaii Panics.”

¹⁰⁷ Sara and Andone, “What Went Wrong.”

¹⁰⁸ Nagourney, Sanger, and Barr, “Hawaii Panics.”

followed because that capability was not a part of the original alert system.”¹⁰⁹ The failure of HI-EMA to quickly respond with a correction notification of the false alert left the public angry and created a lack of trust concerning HI-EMA and its protocols to notify the public of severe dangers.¹¹⁰

C. WHAT WENT WRONG IN THE FALSE ALERT INCIDENT

Hawaii's preparations for a possible nuclear assault by North Korea went awry when a governmental employee accidentally sent the state of Hawaii the incorrect warning signal.¹¹¹ The public was made aware of air-raid siren testing that was done by HI-EMA on a regular monthly basis.¹¹² These tests were to rehearse emergency warning exercises in the case of a potential nuclear attack and this false alarm accident highlighted various shortcomings in the state's emergency processes, public preparation, and federal government response plans.¹¹³

That Saturday morning at HI-EMA headquarters, there was an employee shift change during a normal test of the state's and wireless-emergency alert system.¹¹⁴ During the shift change, the two shift supervisors may have not adequately communicated a proper and thorough turnover. An *Intelligencer* article stated, “A state employee selected ‘missile alert’ instead of ‘test missile alert’ from a drop-down menu in the agency’s alert-system software;” furthermore, the employee submitted a *re-confirmation* to this incorrect selection on the screen.¹¹⁵ This human error resulted in the false missile alert warnings sent to mobile phones throughout the state, and an automated broadcast alert via television and

¹⁰⁹ State of Hawaii Department of Defense, *All-Hazards Preparedness*.

¹¹⁰ State of Hawaii Department of Defense.

¹¹¹ Chas Danner, “The Frightening Lessons from Hawaii’s False Missile Alert,” *Intelligencer*, January 15, 2018, <https://nymag.com/intelligencer/2018/01/the-frightening-lessons-from-hawaiis-false-missile-alert.html>.

¹¹² Danner, “The Frightening Lessons.”

¹¹³ Danner.

¹¹⁴ Danner.

¹¹⁵ Danner.

local radio stations.¹¹⁶ Some military bases responded voluntarily and activated their sirens, although public outdoor sirens were not triggered during the alert.¹¹⁷

As the public responded to the unexpected alert, the staff at HI-EMA were unaware of the alert until much later when other state officials reached out to the agency seeking more information about the threat.¹¹⁸ Even the employee who made the warning alert mistake had no initial knowledge of a missile alert until he received the warning on his own mobile device and then reported it to his immediate supervisor in HI-EMA.¹¹⁹ HI-EMA confirmed there had been no missile threat by the U.S. Pacific Command after three minutes when the alert was sent and had even notified the local police of the discovery.¹²⁰

Within minutes of the confirmation from U.S. Pacific Command of the false alert, HI-EMA issued a cancellation on the alert to cease broadcasting, yet over 15 minutes had already elapsed since the alert went public due a lack of training of the HI-EMA employees on how to stop the false alarm.¹²¹ Via its weak safeguard contingency plans, HI-EMA updated the public via its Facebook page and Twitter account, and this took an additional 25 minutes.¹²² Although alternative methods to notify the public were used with social media, a long time had elapsed before the public was fully notified, and there was a huge disconnect among state and local agencies with regard to updating the public.

Training and preparation efforts led by the HI-EMA Administrator Vern Miyagi were intended to get ahead of the threats coming from North Korea, and this led to the established ballistic missile preparedness campaign beginning in April 2017, an effort that involved Hawaiian Governor David Ige and Hawaiian National Guard Adjutant General Major General Joe Logan.¹²³ The program was under review; Governor Ige signed the

¹¹⁶ Danner.

¹¹⁷ Danner.

¹¹⁸ Danner.

¹¹⁹ Danner.

¹²⁰ Danner.

¹²¹ Danner.

¹²² Danner.

¹²³ State of Hawaii Department of Defense. *All-Hazards Preparedness*, 1–5.

Executive Order 18–01, putting Brigadier General Kenneth Hara in charge of reviewing and revising the state’s emergency response systems.¹²⁴

The FCC began an investigation seeking the truth of what happened during this false alert, and this led to a series of lessons learned for the public warning system as officials strived to ensure preventative measures were in place so this incident would not be repeated.¹²⁵ The false alert mishap exposed HI-EMA’s workers’ complacency and a lack of the professional curiosity about how their equipment and operations functioned. It also showed the lack of operator proficiencies concerning how to activate false alert safeguards necessary to prevent false warning alerts to the public. Additionally, the false alert incident reflects the disconnect between the federal and state responsibilities regarding warnings to the public.

D. LESSONS LEARNED FROM THE INCIDENT

Following the false missile warning, time was critical if the state of Hawaii was to establish an immediate action plan to prevent another occurrence of the events of 2018.¹²⁶ The *All-Hazards Preparedness Improvement Action Plan and Report*, written by Brigadier General Kenneth S. Hara, focused on improving key systems such as “procedures to enhance public notification, timely decision making, and collaboration between state and counties.”¹²⁷ Brigadier General Hara was appointed by Hawaii Governor Ige to lead a diverse team consisting of state and country governments with experts in emergency management, complex problem solving, and strategic communications; together, they were known as the Core Team.¹²⁸ The incident prompted several additional investigations by local, state, and federal agencies into the incident, which has provided plenty of material from which to pull lessons learned.

¹²⁴ State of Hawaii Department of Defense.

¹²⁵ Hennigan, “Hawaii’s False Alarm.”

¹²⁶ State of Hawaii Department of Defense. *All-Hazards Preparedness*.

¹²⁷ State of Hawaii Department of Defense.

¹²⁸ State of Hawaii Department of Defense.

The team dedicated hundreds of hours of research and effort to develop recommendations for the governor of Hawaii to reshape the ballistic missile public emergency warning systems.¹²⁹ Figure 4 illustrates the full team of the organizations that make up the Hawaii Emergency Management Enterprise Environment.¹³⁰ The vision for the team was that all representatives from key departments would collaborate and brainstorm.¹³¹

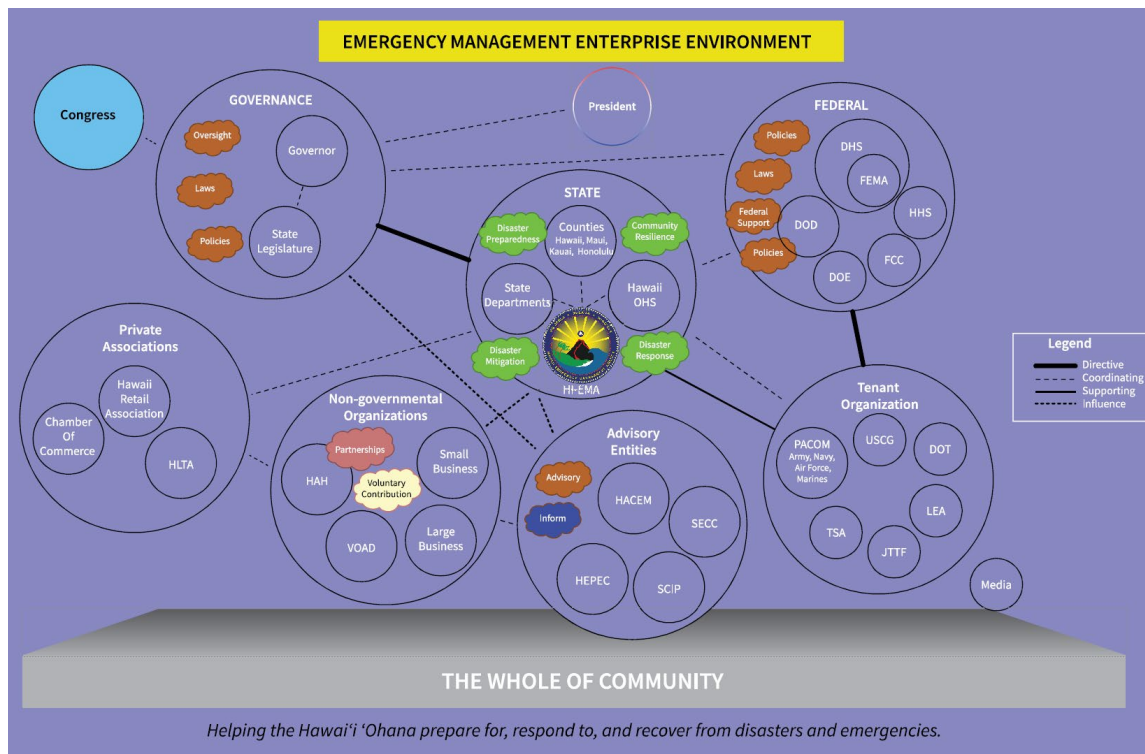


Figure 4. Emergency Management Enterprise Environment Organization Chart¹³²

¹²⁹ State of Hawaii Department of Defense, 5.

¹³⁰ State of Hawaii Department of Defense, 5.

¹³¹ State of Hawaii Department of Defense, 2–4.

¹³² State of Hawaii Department of Defense.

The Core Team utilized the practical strategic thinking approach called the *design thinking method* to organize information and problem solve as well as to mitigate risks.¹³³ The assessment of the Hawaii incident revealed the need for consistency to address Hawaii's vulnerabilities and capability gaps concerning warning the public about and responding to disasters.¹³⁴ To remedy what went wrong during the false alert incident the Core Team recommended Hawaii needed the federal agencies' assistance to improve community inputs and planning efforts when implementing an emergency warning plan.¹³⁵

The outcome from the unfortunate Hawaii false missile incident provides an example of what a struggling qualitative management system looks like and emphasizes the importance of implementing clear and concise standard protocols and safeguards in services.¹³⁶ The *Government Quality Management System: Case Study from the Hawaii Missile Alert* reported, "There was a lack of process and process control, as well as management commitment to ensure effective processes were in place."¹³⁷ As seen in Figure 4, it appeared that HI-EMA assigned roles and responsibilities, yet overlooked management and oversight of its employees.

The case study reveals the lack of consistency in routine operations across department and shift; there was also an absence of unified training scripts due to the lack of management enforcement, even when employees suggested innovative ways to improve system operations.¹³⁸ Although the warning officer who initiated the alert believed he was following drill protocol, the case study reveals that a shift change occurred during a non-scheduled high risk drill and the lack of communication between the day and night shift employees. After further review, the contingency plans for false alarms revealed zero

¹³³ State of Hawaii Department of Defense, 10–25.

¹³⁴ State of Hawaii Department of Defense.

¹³⁵ State of Hawaii Department of Defense.

¹³⁶ Christena C. Shepherd, *Government Quality Management Systems: Case Study from the Hawaii Missile Alert* (Huntsville, AL: Jacobs Space Exploration Group, 2018), <https://ntrs.nasa.gov/citations/20180003500>.

¹³⁷ Shepherd, *Government Quality*, 1–4.

¹³⁸ Shepherd, 1–4.

supervision and the hurdles to contact local, county, state, and federal departments became time consuming. This resulted in the delay of notifying the public of the error in warning.¹³⁹

According to the FCC's *Report and Recommendations*, within minutes of the false alert release, FCC senior leadership had contacted the FCC Operations Center to inform personnel that Hawaii personnel had been issued a false emergency warning.¹⁴⁰ Following protocol, the Department of Homeland Security (DHS) National Operations Center was contacted by the FCC Operations Center to confirm it was in fact a false alert.¹⁴¹ All three agencies were synced together and later FCC leadership informed FEMA of the morning events, FCC Chair Ajit Pai specifically instructed the commission to launch a full investigation focusing on two key concepts, "What went wrong? And what needs to be done to stop a similar mistake from happening in the future?"¹⁴²

Five days after the event, the FCC started to identify mishaps during the event; as part of the two investigations personnel from HI-EMA staff, United States Pacific Command (PACOM), the Hawaii State Emergency Communications Committee, and Hawaii legislators gathered.¹⁴³ Commission investigators attempted to interview all personnel involved with the warning officer who initiated the false alert. The false alert warning system notified stakeholders, as well as emergency managers, wireless providers, the Hawaii Association of Broadcasters, alert software developers supporting HI-EMA, and emergency management agencies. This was to discern existing safeguards to minimize the risk of false alerts.¹⁴⁴

After an extensive investigation, the FCC found that the Hawaii false alert event on January 13, 2018, was a result of not only of human error; there were also non-standardized safeguards during the transmission of warning alerts to the public.¹⁴⁵ The commission's

¹³⁹ Shepherd, 1–4.

¹⁴⁰ Federal Communication Commission, *Report and Recommendations*, 4–5.

¹⁴¹ Federal Communication Commission.

¹⁴² Federal Communication Commission, *Report and Recommendations*.

¹⁴³ Federal Communication Commission.

¹⁴⁴ Federal Communication Commission.

¹⁴⁵ Federal Communication Commission.

report stated, “Neither the false alert nor the 38-minute delay to correct the false alert would have occurred had Hawaii implemented reasonable safeguards and protocols before January 13, 2018” to mitigate and find early false warning alerts before sent out to the public.¹⁴⁶ Had the standardized protocols been available, HI-EMA would have been able to issue a prompt false alert warning correction to the public while minimizing risk and gaining trust of the community.

The state, municipal, and territorial disaster management authorities should take urgent remedial action, according to the *FCC Report and Recommendations*.¹⁴⁷ Human error was the main factor in the failure, specifically failing to comprehend the instructions clearly enough to realize that the exercise was a test.¹⁴⁸ From the report, it seems that there were insufficient measures in place at HI-EMA to lessen the effects of any failures in communication between supervisors and warning officers who were authorized to send out alerts. It appears that HI-EMA's alert proficiency training was had been inadequate in certain safeguards, and the company's alert origination software lacked crucial security measures. After the HI-EMA employee sent the false warning, HI-EMA did not reach out to the public quickly about the error to correct the misinformation publicly and authoritatively.¹⁴⁹

Ultimately, the FCC's analysis of the events and other investigations found that the 2018 Hawaii false missile alert incident was caused by a human mistake combined with poor protection against false warning announcements.¹⁵⁰ The misunderstanding between the midnight and day shift supervisors led to running a drill without sufficient supervision. HI-EMA's alert proficiency training had been deficient, and its alert origination software did not have updated safeguards in place. The *FCC Report and Recommendations states that HI-EMA's* “alert origination software allows users to send both live alerts and internal

¹⁴⁶ Neither the false alert nor the 38-minute delay to correct the false alert would have occurred had Hawaii implemented. 9-1-1 Strike Force, *Report and Recommendations*.

¹⁴⁷ Federal Communication Commission, *Report and Recommendations*.

¹⁴⁸ Federal Communication Commission, *Report and Recommendations*.

¹⁴⁹ Federal Communication Commission.

¹⁵⁰ Federal Communication Commission.

test alerts using the same interface, and the same log-in credentials.”¹⁵¹ Then the notifications would be sent from HI-EMA after pressing the "Send Public Message" button.¹⁵² Consequently, the operators could not tell if the test alert was in internal or in public operating mode.

Since the Hawaii false alert incident in 2018, HI-EMA has improved Hawaii's preparedness capabilities by coordinating the Multi-Year Training and Exercise Programs with local emergency response organizations like the Office Homeland Security, FEMA Region IX, and Pacific area offices.¹⁵³ The goal of the Hawaii Multi-Year Training and Exercise Programs was to provide a roadmap for a program of remedial action to improve planning with realistic drills and cutting-edge training to protect from, mitigate from, respond to, and recover from emergencies and catastrophes.¹⁵⁴

Brigadier General (retired) Bruce Oliveira's investigations following the incident discovered that multiple factors led to the 2018 Hawaii false missile alert, although it was largely the result of a poorly managed missile preparedness campaign by leadership in HI-EMA.¹⁵⁵ The investigation found leadership failures in the areas of decision making and communications resulted in a delay in correcting the error.¹⁵⁶ HI-EMA has been a key player in the response and support of rapid recovery to natural and unforeseen disasters, but the investigation revealed the necessity of federal government oversight when conducting missile attacks emergency responses.¹⁵⁷

The FCC's investigation into this false alert led to a series of lessons learned from what went wrong during a routine emergency warning test.¹⁵⁸ The commission's follow-up intentions were to provide additional education to train state emergency management

¹⁵¹ Federal Communication Commission, 17.

¹⁵² Federal Communication Commission, 17.

¹⁵³ Hawaii Emergency Management Agency.

¹⁵⁴ Hawaii Emergency Management Agency.

¹⁵⁵ State of Hawaii Department of Defense, *All-Hazards Preparedness*, 2–6.

¹⁵⁶ State of Hawaii Department of Defense.

¹⁵⁷ State of Hawaii Department of Defense.

¹⁵⁸ Hennigan, "Hawaii's False Alarm."

agencies, participants, and providers using the EAS and WEA to gain a better understanding of how the systems work together.¹⁵⁹ Subsequently, FEMA has coordinated public safety objectives and held ongoing joint seminars.¹⁶⁰ Furthermore, the FCC has organized roundtable events with all agencies involved with the EAS and WEA to discuss lessons learned and a way ahead after the 2018 Hawaii false alert incident.

This chapter has presented the case study of the Hawaii's false alert incident. It included the events leading up the incident where a HI-EMA employee accidentally initiated a ballistic missile warning amid the increased geopolitical tensions by the North Korean ballistic missile threats to America. The chapter has also reviewed what went wrong during the incident and with Hawaii's preparation efforts for a possible nuclear attack from North Korea.

The false missile incident was an expensive learning experience that highlighted the lack of communication and planning among local, state, and federal administrations. The list of lessons learned from this event clearly show that the HI-EMA warning system protocol needs improvements and should be reviewed and approved at the federal level. Public warning, especially of imminent missile threats, should have the Department of Defense (DOD) as the lead developer of an improved public warning system program, as DOD would receive first notification of an actual inbound missile threat and would be able to confirm or cease any emergency warning issued to the public.

¹⁵⁹ Federal Communication Commission, *Report and Recommendations*.

¹⁶⁰ Federal Communication Commission.

IV. ANALYSIS OF ROLES AND RESPONSIBILITIES WITH PUBLIC WARNING SYSTEMS

As a result of the 2018 Hawaii false missile alert, the FCC's report and recommendations to HI-EMA provided valuable lessons learned to determine the level of responsibility stakeholders need to assume to reduce the risk of false alerts.¹⁶¹ This chapter examines the conflicting roles and responsibilities in the warning and management system among local, state, and federal agencies. First, it explains the different roles within public, missile, safety, and federal warning systems, and then it emphasizes the conflicting roles within the emergency alert systems and how these roles show a lack of cooperation among organizations. Lastly, it argues why it appears federal agencies are best suited to be the overall authorizing management agency when warning the public about missile threats to America.

A. ROLES IN WARNING SYSTEMS

A successful warning system is expected to significantly reduce injury, reduce damage to infrastructures, and save lives. The Communications Act of 1934 directed that the FCC was in charge of promoting the safety of life and materials via communication technologies within federal regulations.¹⁶² Currently, the FCC tasking specifically intends to guide emergency preparedness and response activities with the support of federal agencies, including DHS, while the FCC is considered overall lead with the communication portion of public warning.¹⁶³ Each agency plays a significant role in the support of the warning management systems. The warning systems are divided into public, missile, and safety categories that are among the level of roles and responsibilities within local, state, and federal agencies.

¹⁶¹ Federal Communication Commission, *Report and Recommendations*.

¹⁶² "The Communications Act of 1934," Bureau of Justice Assistance, accessed March 28, 2023, <https://bja.ojp.gov/program/it/privacy-civil-liberties/authorities/statutes/1288#:~:text=The%20Communications%20Act%20of%201934%20combined%20and%20organized%20federal%20regulation,oversee%20and%20regulate%20these%20industries.>

¹⁶³ Bureau of Justice Assistance, "The Communications Act of 1934."

1. Roles in Public Warning Systems

The FCC works with FEMA and federal government partners within state, local, and territorial entities.¹⁶⁴ Its combined objective is to enhance the nation's communications industry with effective and reliable emergency alert and warning systems.¹⁶⁵ FEMA's overall objective is for national preparedness, and it was the lead administrator behind IPAWS messages.¹⁶⁶ The FCC oversees the operations within the EAS and WEA, which are the two nationwide IPAWS emergency alert systems.¹⁶⁷ Communication service providers, including broadcasters and wireless providers, transmit alerts according to their specific guidelines for dissemination.¹⁶⁸ Alert originators are authorized by FEMA to transmit alerts using the IPAWS.¹⁶⁹

EAS qualified participants have the ability to deliver alerts pertaining to emergencies and are managed by the national public warning system, EAS.¹⁷⁰ Some recognized Participants in the EAS include radio and television broadcast stations, as well as cable networks, and digital audio radio service providers.¹⁷¹ An essential advantage of the EAS is the capability for the president of the United States to supply instant communication and supplementary information to the public during national emergency occurrences, all national, state, and local levels.¹⁷²

Administration and maintenance of the EAS is divided by each state and appointed by the state emergency communication committees, broadcast representatives, and

¹⁶⁴ Federal Communication Commission, *Report and Recommendations*.

¹⁶⁵ Federal Communication Commission.

¹⁶⁶ Federal Communication Commission.

¹⁶⁷ Federal Communication Commission.

¹⁶⁸ Federal Communication Commission.

¹⁶⁹ Federal Communication Commission.

¹⁷⁰ 47 CFR § 11.1; *Sixth Report and Order in the Matter of Review of the Emergency Alert System*, EB Docket No. 04-29630 Federal Communications Commission, Rcd 6520 (2015), <https://docs.fcc.gov/public/attachments/FCC-15-60A1.pdf>.

¹⁷¹ 47 CFR § 11.11(a).

¹⁷² 47 CFR § 11.1; *Sixth Report and Order*, see specifically 20 FCC Rcd 18625, 18628, para. 8 (2005). The FCC, FEMA, and the National Weather Service implement the EAS at the federal level.

representatives of state and local government.¹⁷³ State emergency communications committees coordinate monthly EAS tests with the state emergency management agencies, and the FCC reviews and approves EAS plans to ensure they are in accordance with the FCC.¹⁷⁴ A common distribution structure with the EAS is led by state and local authorities to distribute voluntary weather-related and other emergent alerts needed to be passed.¹⁷⁵

EAS participants are mandated to broadcast a presidential warning when it is activated, while WEA has a different approved system for distributing warning alerts.¹⁷⁶ WEA has the ability to transmit geo-targeted emergency notifications through wireless providers and government agencies who have elected to participate in WEA.¹⁷⁷ When participants of WEA want to transmit alerts, they do so over cell towers to mobile devices within the allotted service areas.¹⁷⁸ The participation in WEA is completely voluntary under federal regulations and allows providers to choose to participate as long as their programs comply with the FCC rules.¹⁷⁹

Providers of national emergency alert and warning systems are required by the FCC to regularly test their alerting capabilities to enhance the effectiveness of the EAS and WEA systems.¹⁸⁰ EAS participants are to support national monthly and weekly tests with FEMA coordination and are specific to each state's EAS plans.¹⁸¹ The FCC requires WEA wireless providers to participate in monthly tests in connection to FEMA's IPAWS to evaluate their alert transmission and test capabilities.¹⁸² Effective as of May 2019, the FCC requires the elected end-to-end WEA testing launched by federal, state, and local emergency managers will be supported by wireless operators, who are able to review the capability of tests

¹⁷³ *Sixth Report and Order.*

¹⁷⁴ Federal Communication Commission, *Report and Recommendations.*

¹⁷⁵ 9 Federal Communication Commission

¹⁷⁶ *Sixth Report and Order.*

¹⁷⁷ Federal Communication Commission, *Report and Recommendations.*

¹⁷⁸ *Sixth Report and Order.*

¹⁷⁹ Federal Communication Commission, *Report and Recommendations.*

¹⁸⁰ Federal Communication Commission.

¹⁸¹ *Sixth Report and Order.*

¹⁸² Federal Communication Commission, *Report and Recommendations.*

received by the public to reflect an actual alert.¹⁸³ To safeguard testing procedures and avoid false alerts to the public, the FCC requires obvious language that is clear to the public of an actual test event for both EAS and WEA test messages.¹⁸⁴

Additionally, the FCC places a huge emphasis on proficiency training for state and local emergency managers and all entities that are allowed to be alert originators in IPAWS as approved by FEMA.¹⁸⁵ Internal tests are designed not to be exposed to the public, and the FCC observes, “Alert origination software can be used to support internal proficiency training exercises where emergency managers wish to iterate alert origination best practices in a closed environment.”¹⁸⁶ Conducting live tests allows the members of the public to see the alerts and be aware of what responses they should plan in case of an actual warning alert.¹⁸⁷ Furthermore, alert initiators must be more proficient with their use of alerting tools, and it should be noted that live tests are only allowed by EAS participants who are approved by FEMA and FCC.¹⁸⁸

2. Roles in Missile Warning Alert Systems

The U.S. Northern Command (NORTHCOM) was created as a combatant command on October 1, 2002.¹⁸⁹ NORTHCOM provides centralized authority of the DOD’s homeland and defense initiatives in order to coordinate defense assistance for civil authorities.¹⁹⁰ Its jurisdiction extends over the air, land and waterways within the continental territories within the United States.¹⁹¹ With the evolving challenges in homeland security and defense, this requires the civil defense authorities to sustain a strong

¹⁸³ Federal Communication Commission, *Report and Recommendations*.

¹⁸⁴ Federal Communication Commission.

¹⁸⁵ Federal Communication Commission.

¹⁸⁶ Federal Communication Commission.

¹⁸⁷ *Sixth Report and Order*.

¹⁸⁸ Federal Communication Commission.

¹⁸⁹ Federal Communication Commission.

¹⁹⁰ “Defending the Homeland,” U.S. NORTHCOM, accessed April 1, 2023, <https://www.northcom.mil/HomelandDefense/>.

¹⁹¹ U.S. NORTHCOM.

and deadly fighting capacity to prevent strikes within the homeland.¹⁹² Maritime, aeronautical, and cyber strikes, as well as attacks using weapons of mass destruction, are the most serious military threats to North America. The DOD's goal is to discourage, detect, and mitigate such threats to its nation's borders.¹⁹³

Nearly a half century earlier, the United States and Canadian governments formed NORAD in 1958, a binational organization with the mission of aerospace surveillance management over North America.¹⁹⁴ Aerospace warning involves the monitoring of artificially created objects in space, as well as the authentication, and assurance of warning of attacks on North America.¹⁹⁵ The commander of NORAD, who is dual-hatted as the United States NORTHCOM command, plays an important role in carrying out the aerospace warning mission. NORAD offers indicators and early threat assessments to the Canadian and American governments, as well as a fast military response capacity.¹⁹⁶ Moreover, NORAD is an important aspect of homeland defense since it supports civil authorities' protection and defense against national airspace threats.¹⁹⁷

The top priority of both NORTHCOM and NORAD is homeland defense. In support of this, the federal government has appointed FEMA and HI-EMA to play key roles in the missile warning review of the 2018 Hawaii false missile alert.¹⁹⁸ HI-EMA has statewide coordination and oversight of outdoor siren warning systems, continuous monitoring, and issuance of alerts and warnings; it also facilitates emergency and disaster response and recovery activities in Hawaii.¹⁹⁹ It operates a state-based communications warning center that is best known as the State Warning Point, and according to FEMA, it

¹⁹² U.S. NORTHCOM.

¹⁹³ U.S. NORTHCOM.

¹⁹⁴ "NORAD History," North American Aerospace Defense Command [NORAD], accessed April 1, 2023, <https://www.norad.mil/About-NORAD/NORAD-History/>.

¹⁹⁵ NORAD, "NORAD History."

¹⁹⁶ NORAD, "NORAD History."

¹⁹⁷ NORAD, "NORAD History."

¹⁹⁸ State of Hawaii Department of Defense, *All-Hazards Preparedness*.

¹⁹⁹ Haw. Rev. Stat. § 127A-3(e) (2017). HI-EMA is a division of the Hawaii Department of Defense.

is the only organization to allow complete its certification process to allow FEMA operators to initiate alerts over IPAWS.²⁰⁰

The State Warning Point is operated by HI-EMA in a 24-hour and seven-day-per-week rotation to monitor and respond to actual or potential emergencies.²⁰¹ Additionally, serving as the warning point for each county, the State Warning Point transmits and receives emergency messages to and from the Emergency Operations Center using the Hawaii Warning System.²⁰² Finally, the State Warning Point is staffed by about 11 HI-EMA warning officers and four supervisors that rotate in day, night, and midnight shifts.²⁰³

During the events leading to the 2018 false missile alert in Hawaii, there was a 45-minute overlap in-between shifts for oncoming and off-going shifts to take the watch and debrief the previous shifts events according to their online status board.²⁰⁴ As a routine, warning officers monitor warning devices and can distribute warnings and notifications to government officials, emergency operations center, and, as ordered, to the general public.²⁰⁵

As the agency with oversight of early warnings, HI-EMA has been responsible for performing ballistic missile drill tests and practicing alert and warning capabilities.²⁰⁶ As part of its designed ballistic missile defense training regimen, HI-EMA conducts frequent, no-notice simulated incidents in which PACOM notifies HI-EMA that Hawaii is under a ballistic missile threat.²⁰⁷ The training begins with a pretend call from a warning officer

²⁰⁰ State of Hawaii Department of Defense, *All-Hazards Preparedness*.

²⁰¹ Federal Communication Commission, *Report and Recommendations*.

²⁰² Hawaii Emergency Management Agency, “About Us,” accessed March 28, 2023, <http://dod.hawaii.gov/hiema/contact-us/about-us/>.

²⁰³ Federal Communication Commission, *Report and Recommendations*.

²⁰⁴ Federal Communication Commission.

²⁰⁵ Federal Communication Commission.

²⁰⁶ Office of Inspector General, Department of Homeland Security, *FEMA’s Oversight of the Integrated Public Alert & Warning System (IPAWS)*, OIG 19–08 (Washington, DC: Office of Inspector General, Department of Homeland Security, 2018), <https://www.oig.dhs.gov/sites/default/files/assets/2018-11/OIG-19-08-Nov18.pdf>. See specifically 1 and Appendix B (outlining HI-EMA’s ballistic missile preparedness public awareness campaign between March 2017 and January 2018).

²⁰⁷ Federal Communication Commission, *Report and Recommendations*.

modeling the role of PACOM and concludes with an internal non-public transmission test message to FEMA.²⁰⁸ Additionally, this will employ the use of IPAWS, with zero simulated calls broadcasted to consumers personal devices such as their smartphones, computers, and even through public radio stations.²⁰⁹

Over time, HI-EMA refined the defense training protocols and procedures for this specific type of drill and considered tests of the 20-step ballistic missile alert checklist, practice exercises, and feedback on lessons learned.²¹⁰ Additionally, HI-EMA updated its older alert origination software with an updated compatible software during practice drills.²¹¹ The new software simulated PACOM's initial notification message with the phrase, "Exercise, exercise, exercise."²¹²

3. Roles in Public Safety Warning Systems

First responders are the first to react and provide aid to the public when emergency situations arise. During the 2018 false missile alert in Hawaii, according to the FCC's investigation, 911 operators and police were on duty during the false alert incident and made extraordinary steps to inform the public to correct the alert message within minutes of receiving confirmation that alert report was false.²¹³ The report noted that HI-EMA had notified the surrounding counties and the Honolulu Police Department of its mistaken ballistic missile alert sent out to the public.²¹⁴ As a result, the police officers had used their vehicles to notify the public of the false attack alert, and although the message was not received by the general public in a timely manner, law enforcement and emergency dispatchers were initially able to transmit urgent messages to the public.²¹⁵

²⁰⁸ Federal Communication Commission.

²⁰⁹ Federal Communication Commission.

²¹⁰ Federal Communication Commission.

²¹¹ Federal Communication Commission.

²¹² Federal Communication Commission.

²¹³ Federal Communication Commission.

²¹⁴ Federal Communication Commission.

²¹⁵ Federal Communication Commission.

Public safety authorities have immediate contact with state officials. During the false alert, incoming calls from a panicking public overwhelmed the phone lines. Due to these congested phone lines, state and local officials, including those at HI-EMA, had challenges notifying the public and each other that the ballistic missile alert was false.²¹⁶ Therefore, HI-EMA contacted local law enforcement to issue correction messages as a source of immediate notification to surrounding areas. According to the FCC's investigation report, DHS Office of Emergency Communication offers priority calling services, which include the companion service programs the Government Emergency Telecommunications Service (GETS) and the Wireless Priority Service (WPS).

These programs provide priority access over landline and cellular networks during an emergency. Federal, state, and local agencies have the ability to enroll in GETS and WPS.²¹⁷ The FCC reported in its investigation that HI-EMA's employees had access to GETS and WPS during the 38-minute false alert message in Hawaii, yet no one utilized the services.²¹⁸ It is uncertain why HI-EMA officials did not use the priority calling services available to them, although the report stated that HI-EMA staff did communicate directly with the counties.²¹⁹ Fortunately, local law enforcement and emergency dispatchers were able to be of service and spread awareness of updates to the 2018 false missile incident to the public.

4. Federal Roles in the Warning Systems

The Office of the Secretary of Defense, US NORTHCOM, NORAD, FEMA, and HI-EMA are the agencies in charge of homeland defense and early warning of potential disasters; all play a variety of key roles and assume different responsibilities in emergency warning management.²²⁰ Since the early 19th century, the federal government has appeared to be initially in charge of the public warning management program. However, it seems

²¹⁶ Federal Communication Commission.

²¹⁷ Federal Communication Commission.

²¹⁸ Federal Communication Commission.

²¹⁹ Federal Communication Commission.

²²⁰ Federal Communication Commission.

that the federal government has delegated its responsibilities for warning management programs to state and local agencies over the last century. Yet, the federal government's oversight of implementing safeguards and its process of controls to prevent false warning alerts should be revised.

As stated in the Homeland Security Science and Technology Wireless Emergency Alerts Enhancement Recommendations,

Under Executive Order 13407, the Secretary of the Department of Homeland Security (DHS), in coordination with the Department of Commerce, and the FCC, is responsible for implementing and administering the national public emergency alert system and ensuring that the president can alert and warn the American people in the case of an emergency.²²¹

The federal government's involvement in issuing warnings to the public is imperative. It not only has access to more advanced intelligence resources than states do, but the federal government has invested lots of money to collect and analyze intelligence from numerous sources for the protection and wellbeing of the country. For example, the federal government has critical intelligence and relative information and can articulate an efficient preparedness action plan to warn the public. Furthermore, the federal government has the inherent right and responsibility to defend the country and that should start with proper pathways of communication, especially in emergency warning.

FEMA utilizes the IPAWS system to communicate early warning to the public, and the FCC authorizes the participants who can operate via EAS and WES. According to FEMA, "FEMA, in partnership with the FCC and NOAA, is responsible for implementing, maintaining and operating the EAS at the federal level."²²² Supported on a federal level and using the EAS, the IPAWS system includes benefits such as the ability to interrupt radio and television broadcasting, coverage of a large geographic area, and capability to

²²¹ U.S. Department of Homeland Security, Science and Technology, *Wireless Emergency Alerts: System Enhancement Recommendations* (Washington, DC: Department of Homeland Security, Science and Technology, 2013), <https://www.dhs.gov/sites/default/files/publications/Wireless%20Emergency%20Alerts%20System%20Enhancements.pdf>.

²²² Federal Emergency Management Agency, "Emergency Alert System."

display messages full screen with audio attachments, and in additional languages.²²³ Given the federal government's involvement with re-structuring the emergency warning management hierarchy, it seems natural it would provide an increased overall insight to warning stakeholders on the process and procedures of issuing warning alerts to the public.

As a result of the 2018 false missile alert in Hawaii, a significant issue on how states issue warning alerts was the length of elapsed time before the public could be notified that an alert was false. As stated in 2018 by Danner, "It is not yet clear why it took the agency, or anyone else in the state government, 13 minutes to send out some kind of public message canceling the alarm."²²⁴ The Hawaiian state government did not immediately notify local media stations to help disseminate the correction alert to the public. Eventually, the public received the updated correction alert via alternative methods.

About a half an hour into the terrifying false missile alert to the public, HI-EMA officials attempted to reach out to the public with an improvised correction notification via social media.²²⁵ Even so, HI-EMA and state officials forgot that there were planned procedures already in place to issue corrected warning alerts to the public. According to the *Intelligencer*, HI-EMA "had to get authorization to send the correction from the Federal Emergency Management Agency, which oversees the national alert system."²²⁶ Although state and local warning agencies have the authority to issue warning alerts to the public, according to the procedures within the national alert system, FEMA must authorize a correction message for states to issue to the public.²²⁷

The federal government's key role in the warning management system is vital. It is the overall authorizing authority for national alerts, including warning alerts and the dissemination of emergency messages that rely on federal stakeholder's authorization to issue messages to the public. FEMA is the appointed official authority in accordance with

²²³ Federal Emergency Management Agency.

²²⁴ Danner, "The Frightening Lessons," 6–7.

²²⁵ Danner.

²²⁶ Danner.

²²⁷ Danner.

the national alert systems. DHS, the Department of Commerce, and the FCC hold the overall responsibilities within the national alert warning system to ensure the president has the capability of issuing emergency warnings to the public.²²⁸ This includes the ability to deliver corrective actions in overriding or canceling public warning announcements when necessary. Therefore, as this research demonstrates, the federal government has a responsibility and key role in issuing and canceling emergency warning alerts to the public.

The partnership between the federal and state agencies plays a large role in the efforts of protecting and improving policies in homeland security and defense. Federal agencies are equipped to warn the public of missile threats along with the development and sustainment in proficiency planning, operational coordination, and operational communications with state agency cooperation. Overall, the federal government's responsibility for the preparedness training and drill exercises, while partnered with local and state warning agencies, ensures the proactive development of issuing emergency warning alerts to the public.

B. CONFLICTING ROLES WITHIN THE EMERGENCY ALERT SYSTEMS

Lessons learned from the 2018 recent false warning alert incident in Hawaii demonstrate conflicting roles and responsibilities within the emergency alert warning system between local, state, and federal agencies with regard to who should issue or cease warnings and who should be responsible overall in the development of the public warning alert program. Furthermore, there is a disconnect between local, state, and federal stakeholders when it comes to warning the public, and it seems that this is due at least in part because of the federal government's lack of cooperation, communication, and accountability when it comes to the process of emergency warning.

All three stakeholders—local, state, and federal—have the best of intentions regarding the process and issuance of emergency warnings to the public; yet, the overall warning management and procedures in the Hawaii incident were not clear to the state employees. According to FEMA, “An alerting authority is a jurisdiction with the

²²⁸ Danner.

designated authority to alert and warn the public when there is an impending natural or human-made disaster, threat, or dangerous or missing person.”²²⁹ Across the states, an alert authority’s roles and responsibilities are designed differently regarding its duties. Overall, the alert originator would be in charge of distributing the alerts.²³⁰ The role and duties of an alert authority appear to be straightforward. This person is expected to be the operator who warns the public of any emergencies; however, the alert authority would not have oversight in issuing actual or training alerts, which might lead to confusion if there was a question of the alert’s authenticity.

Based on the January 2018 Hawaiian routine emergency warning drills, a state employee was the only appointed alert authority with the power to send an emergency message to the entire Hawaiian populace, but there was zero oversight.²³¹ This particular state employee was the cause of the incorrect submission of an inbound missile warning to surrounding area of Hawaii and exposed the state’s lack of training and readiness for its employees to initiate and respond to warnings.²³² Some may claim that the 2018 false missile alarm in Hawaii was simply the result of human error. However, the state employee was following alerting policy at the time for informing the public, and the problem stemmed from a lack of training and proper protocols as much as from human error.²³³

Alert originators are trained to utilize IPAWS to send out urgent messages with the direction of the alert authorities’ specific guidance.²³⁴ There are over 100 agencies alerting authority systems with IPAWS that lack the most updated warning software and guidance from the FEMA, and as a result, warning messages through IPAWS may not consistently provide the most accurate information.²³⁵ Moreover, it appears that the alert guidance for the state employees is not completely understood and/or followed by said employees.

²²⁹ Federal Emergency Management Agency, “Integrated Public Alert and Warning System.”

²³⁰ Federal Emergency Management Agency.

²³¹ Danner, “The Frightening Lessons.”

²³² Danner.

²³³ Danner.

²³⁴ Federal Emergency Management Agency, “Alerting Authorities.”

²³⁵ Federal Emergency Management Agency.

According to FEMA, “IPAWS and its associated delivery pathways is a valuable tool that allows alerting authorities to serve their jurisdictions during an emergency.”²³⁶ This statement shows that the federal agencies allow local and state jurisdictions to make their best local judgement to issue public warnings and federal stakeholders have no overall authority in the messages. In this case, the state employee appointed by the alert authority in the 2018 Hawaii false missile incident made a judgment call by issuing the actual missile warning to the public with no concurrence from higher authority, such as federal stakeholders. From the state employee’s perspective, the employee was following procedures to his best ability and judgment.

FEMA’s belief on best practices when sending urgent messages using the alert, warning, notification during local emergencies is that elected local officials should provide notifications within their jurisdictions.²³⁷ Distributing WEAs to the public is a decision made by local officials who are charged to carry out emergency action plans and procedures, while according to FEMA’s policies, “FEMA does not provide nor place limitations or restrictions on criteria for authorized alerting authorities (AAs) to issue a WEA to the public.”²³⁸ By FEMA allowing local officials to carry out emergency procedures and placing the warning responsibility on one individual, the alerting authority, local, state, and federal warning managers are not notified until they saw the WEA on their own smart phone devices.

FEMA’s limited involvement with the issuing and review of warning messages gives states the authority to dictate and disseminate emergency alerts to the public. According to the *Intelligencer* article, “FEMA does not monitor, review, modify, approve, or disapprove the message text content of WEAs drafted and disseminated by AAs.”²³⁹ The *Intelligencer* also stated FEMA believes that with message, “Alert content, time of

²³⁶ Federal Emergency Management Agency.

²³⁷ Federal Emergency Management Agency.

²³⁸ “Best Practices for Alerting Authorities Using Wireless Emergency Alerts,” Federal Emergency Management Agency, last updated March 24, 2023, <https://www.fema.gov/emergency-managers/practitioners/integrated-public-alert-warning-system/public-safety-officials/alerting-authorities/best-practices>. Federal Emergency Management Agency, “Best Practices.”

²³⁹ Federal Emergency Management Agency.

transmission, utilized event code, targeted area, duration, and the decision to update or cancel an AWN is the sole responsibility of an AA.”²⁴⁰ Overall, FEMA has authorized alert authorities to have the overall message authority whether the information is accurate or not and removes the federal responsibility for the warning alert authority.

Allowing a single individual to use best judgement to issue an emergency warning alert to the public is a flaw within the emergency warning system itself. If there was a missile warning alert, it may be best practice for NORAD or FEMA to confirm there was an actual threat and then authorize the local alerting authorities to issue the warning alert. Considering the latest but old equipment in the WEA system, the false alarm episode in Hawaii is the most recent and extreme illustration of the issues with the American emergency warning system. On mobile devices supported by every significant U.S. mobile carrier, wireless emergency warnings are shown as notifications.²⁴¹ The lack of redundancy and safeguards against human error when issuing warning alerts to the public is a definite flaw in the emergency alert program.

According to the FEMA, there are three different kinds of WEAs: direct presidential alerts, alerts regarding impending risks to the public's safety, and AMBER alerts for missing children.²⁴² The first two alert types can be issued by federal, state, and local authorities, provided that FEMA, which oversees the system, has granted those agencies that ability.²⁴³ Despite the fact that warnings delivered to mobile devices are now the most convenient way to contact the majority of the American population, the system has numerous flaws, and the false alert in the 2018 Hawaiian fiasco demonstrates the conflicting roles and responsibilities with all three stakeholders—local, state, and federal agencies.²⁴⁴

²⁴⁰ Federal Emergency Management Agency.

²⁴¹ Federal Communication Commission, *Report and Recommendations*.

²⁴² Federal Emergency Management Agency.

²⁴³ Federal Emergency Management Agency.

²⁴⁴ Danner, “The Frightening Lessons.”

The delay in updating the public of the warning error during Hawaii's 2018 false alert incident highlighted concerns for people with disabilities. According to the FCC's *Report and Recommendations*, during the false alert the National Association of the Deaf members were in Hawaii in the middle of a board meeting and immediately sheltered once the warning alert was brought to their attention.²⁴⁵ As the incident played out, they were tucked away in a storage area and were not only terrified but unaware it was a false alert for an extended period of time. Even after the public broadcasts confirmed it was a warning error, they were not able to hear radio or news updates.²⁴⁶ The 2018 event in Hawaii raises issues not only about the effectiveness of warning alert systems to the public via wireless emergency alert systems but also how to spread awareness to those challenged in receiving warning alerts.

State and local authorities' roles and responsibilities during an emergency alert include keeping people informed and bringing order to the surrounding areas, yet state and local authorities were in a state of confusion during the false missile alert incident.²⁴⁷ Police departments were shocked and overwhelmed by the chaos that erupted in Hawaii, and they had trouble responding to the public, which was seeking shelter.²⁴⁸ Additionally, Honolulu's emergency line struggled to respond to thousands of calls, which led to police using their vehicles' public address systems to communicate with the community to issue the corrective alert messages.

American technology continues to advance at a steadily increasing pace.²⁴⁹ An outdated public warning management program is not useful if it is unable to issue accurate information to the public.²⁵⁰ As the technology of public warning systems progresses, agencies in charge of these systems need to understand the public warning systems' key

²⁴⁵ Federal Communication Commission, *Report and Recommendations*.

²⁴⁶ Federal Communication Commission.

²⁴⁷ Danner, "The Frightening Lessons."

²⁴⁸ Danner.

²⁴⁹ Kirsty Grant, "Public Warning Systems: Keeping Pace with Technology," Everbridge UK, October 8, 2019, <https://www.linkedin.com/pulse/public-warning-systems-keeping-pace-technology-kirsty-grant>.

²⁵⁰ Grant, "Public Warning Systems."

roles and how to provide training when planning pre-incidental drills.²⁵¹ With these drills, agencies would be able to practice how to alert proper response agencies and provide guidance on how to execute a post-event recovery plan.²⁵²

The false missile alert event that happened in Hawaii on January 13, 2018, is a reminder that although America is evolving with its public warning systems, its enemies have the capability to attack with little notice and that federal, state, and local agencies must coordinate together on how to properly coordinate warning systems with each other. With so many agencies invested in the warning alert systems, federal and state officials play a key role in the process to warn the public and to implement safeguards and controls to prevent inadvertent warnings. Fortunately, the local, state, and federal leadership have the resources and lessons learned from past false missile alert incidents to mitigate future false alerts and to warn the public efficiently as long as the roles and responsibilities among warning stakeholders—local, state, and federal—are assigned and clear to follow.

C. ANALYSIS OF THE FEDERAL GOVERNMENT’S ROLE IN WARNING SYSTEMS

The federal government’s roles and responsibilities to state and local agencies for the development of the warning management program is crucial. By exploring the different level of roles and responsibilities within the agencies involved within the public warning system, this research has discovered that each agency plays a significant role in the support of the warning management system. Federal stakeholders hold an authoritative position already in the national alert system and appear to have final oversight for anything related to the emergency warning system.

Since the early 1900s, the federal government seems to assume a significant higher level of responsibility within the public warning management program. The Office of the Secretary of Defense, US NORTHCOM, NORAD, FEMA, and state agencies like HI-EMA have important roles and responsibilities concerning emergency warning management. The federal government appears to be best suited to adopt the lead role in

²⁵¹ Grant.

²⁵² Grant.

providing insight and act as the overall alerting authority responsible for issuing and cancelling emergency warning alerts. FEMA, a federal level agency, already has oversight of the national alert system and already acts as the authorizing authority for corrections in regard to warning alerts.²⁵³

This research concludes that the federal government is the best candidate to provide proper oversight in implementing the safeguards and its process of controls to prevent false warning alerts. Additionally, it appears to be the best qualified, equipped, and prepared to do so, and the federal government also appears to be the best level of authority to oversee re-structuring the emergency warning management hierarchy and emergency preparedness plans. In doing so, the federal government would then be in a position to significantly reduce the conflicting roles and responsibilities among federal, state, and local agencies within the emergency alert system and standardize the alerts across the country.

²⁵³ Danner, “The Frightening Lessons.”

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V. CONCLUSIONS AND RECOMMENDATIONS

This thesis research introduced and examined the roles and responsibilities of the three levels of government: local, state, and federal, which are capable of issuing over 70,000 emergency warning alerts to the public.²⁵⁴ This thesis compared evolution of public warning systems since the Cold War to the programs and procedures used today. The case study on the 2018 Hawaii false alert incident included a description of the events leading up to and during the false missile alert event as well as provided lessons learned for preventing false warnings from happening again. Furthermore, this thesis identified, evaluated, and analyzed by numerous qualified sources on the conflicting level of roles and responsibilities among federal, state, and local agencies within the warning management system.

In addition, the research focused on determining what level of government should have responsibility to warn the public about missile threats to the United States. During the 2018 Hawaiian false alert incident, it was unclear what level of government was responsible for warning the public of such threats. However, this research has established that an increased state of readiness needs to be implemented regarding the threat of nuclear attacks against the United States. In regard to releasing warning messages to the public, the U.S. emergency alert system needs a complete evaluation by the federal government, and it needs to be upgraded to include mitigating measures to prevent inadvertent false alerts issued to the public.

The federal agencies are responsible to ensure that in the event of national emergencies, and the U.S. president has the capability to alert and warn the public through IPAWS.²⁵⁵ This critical warning system can transmit warnings directly from the president to residents via smart devices.²⁵⁶ However, within the federal government, the division of

²⁵⁴ “Wireless Emergency Alerts (WEA),” Federal Communications Commission, accessed April 2, 2023, <https://www.fcc.gov/consumers/guides/wireless-emergency-alerts-wea>.

²⁵⁵ U.S. Department of Homeland Security, Science and Technology, *Wireless Emergency Alerts*.

²⁵⁶ “Integrated Public Alert and Warning System,” Federal Emergency Management Agency, last updated April 6, 2021, <https://www.fema.gov/emergency-managers/practitioners/integrated-public-alert-warning-system>.

responsibility and the accessibility to the IPAWS system should be further reviewed so that an efficient proficiency training program can be implemented for all authorized IPAWS users to enhance the flow of communication between all warning stakeholders, especially through the primary stakeholders for warning alerts—federal agencies.

This research argues that the federal government should be more directly involved in issuing warning alerts, especially missile warning alerts, to the public. According to Executive Order 13407, the secretary of the DHS, Department of Commerce, and the FCC are responsible for the implementation and administration policies within the national public emergency alert systems.²⁵⁷ Understanding the different roles of local government, NORAD, and FEMA in detecting and warning threats to the United States is vital. The federal government would then be in the best position to reduce conflicting roles and responsibilities among federal, state, and local agencies within the emergency alert system and standardize the warning alert procedures across the country.

Moreover, the federal government would be best equipped to warn the public of incoming missile threats, and this is due to its control of and exclusive ability to access best intelligence and relative information available. America's enemies have the capability to attack with little notice, and the American federal government would be best suited to establish an efficient preparedness action plan and for issuing warnings to the public. Not only should the federal government be responsible, but also the states could play a larger role in the development of warning the public about missile threats with regard to having effective communication among all stakeholders.

This thesis interpreted data collected from literature reviews, case studies, and many other sources to discover the disconnect among local, state, and federal agencies, when it comes to who is responsible for such warnings. This research revealed the need for further assessment and review on policies and procedures when it comes to implementing safeguards for issuing false alerts and providing proper training for assigned agency personnel involved in the work of warning since, historically, they have been held in charge of the public warning management program since the early 19th century.

²⁵⁷ Department of Homeland Security, Science and Technology, *Wireless Emergency Alerts*.

In conclusion, the United States will continue to face new and increased missile threats to its homeland security. A federally mandated preparedness proficiency training system for local and state agencies is necessary to provide an improved cohesive warning system program and improved safeguards for mitigating human error. The federal government should set the foundation and be overall in charge of implementing warning system protocols. Also, it should foster state agency readiness teams to collaboratively work together with stakeholders and reduce misunderstandings on the roles and responsibilities with emergency warning to the public. Furthermore, federal agencies should be accountable for the proficiency training programs in alerting the public of missiles threats, this would have the added benefit of gaining the public's trust in its public warning and defense protocols.

Given the lessons learned from the 2018 false-warning event in Hawaii, it is imperative for the federal government re-establish its lead role in the implementation of policy and procedures in the emergency warning management system that local and state warning authorities can shadow. Federal stakeholders already have access to critical intelligence and relative information available to articulate an efficient preparedness action plan in warning the public. The Office of Secretary of Defense, U.S. NORTHCOM, NORAD, FEMA, and state offices such as HI-EMA are the agencies in charge of homeland defense and early warning of potential disasters. Each warning agency plays a key role and assumes different responsibilities within the emergency warning management program. Finally, the federal government plays the most vital role of them all due to its most accurate resources in regard to warning alerts.

The federal government's lead role in the emergency warning alert management should be in partnership with state and local agencies to lead and coordinate among all warning stakeholders, including those local and state stakeholders, on how to properly operate warning systems and provide safeguards against false warnings. The federal government's direct involvement in issuing warnings to the public would greatly assist in the facilitation of the baseline foundation within the warning alert system procedures, and federal oversight would help the supporting role of state and local officials in the execution of warning the public efficiently.

This thesis recommends that DHS follow-up about the 2018 Hawaii false alert case study's lessons learned and ensure all levels of government synchronize and ensure the national preparedness training will help facilitate future incident management systems. Moreover, the FCC also needs to ensure the alert warning procedures are updated to include adequate supervision on site during drills and real alert exercises. Finally, it is vital that the FCC expands its proficiency training within the Department of Education so that future warning officers are the best qualified, authorized, and trained to initiate public warning systems to the public.

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