

Hawaii's Nuclear Warning Scare

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Wireless Emergency Alert History

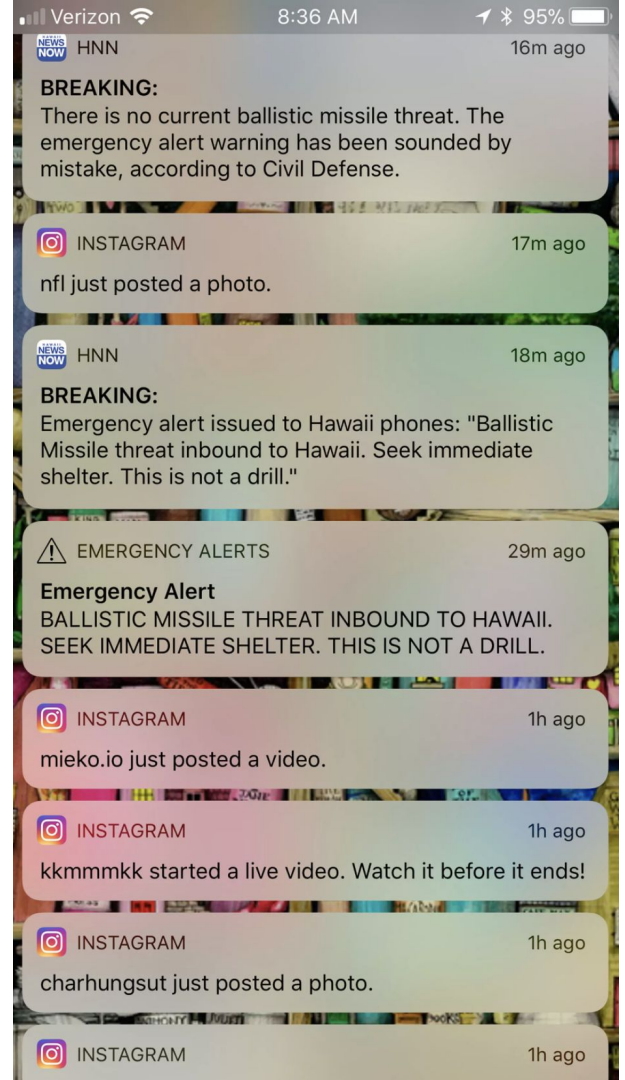
- Introduced in 2012 to modernize TV alerts and provide information conveniently via mobile devices
- Hundreds of federal, state, local, tribal and territorial organizations have the ability to send WEAs (Wireless Emergency Alerts)
- More than 30,000 alerts have been sent since its introduction
- WEAs are carried by all mobile carriers
- Criticized for its ability to cause rapid widespread panic and the lack of guidance it provides citizens



Uncovering the Factors that Led to the Accident

Background

- On January 13 in 2018, Hawaii citizens were mistakenly sent a WEA informing them of a false alarm “ballistic missile threat”
- HEMA (Hawaii Emergency Management Agency) was unable to call off the alert for 38 minutes
- Considered the most impactful mistake since the introduction of WEAs - black swan occurrence
- FCC cites a lack of “reasonable safeguards or process controls” as the cause of the catastrophe



State vs Employee 1: Where Was the Error?

Employee 1

Didn't hear the part of the informing phone call where it was stated that the ballistic missile WEA was a drill

- “Drills were not done routinely in the office.”
- “There was an error in the phone call transmission.”
- “Drill occurred near a shift change.”

State (Hawaii)

Believes informing phone call stated it was a drill multiple times

- Fired Employee 1 after he received death threats from anonymous callers to HEMA
- “We simply need to address the problems in order to fix them -- not just in Hawaii, but anywhere... they may exist.”

Distinction Between Demo and Live WEA

Demo WEA

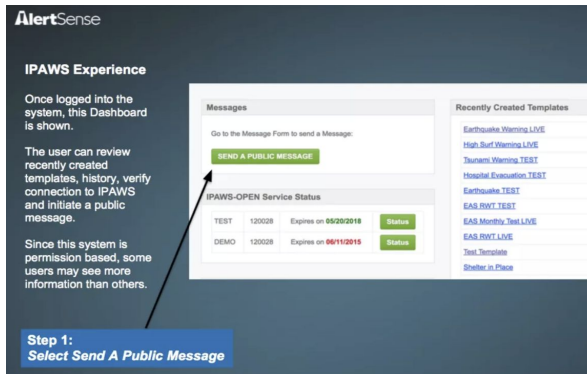
- Used for testing purposes to ensure operators and system are prepared when needed
- Usually associated with a specific disaster or event
- Signified to public by writing “TEST” in the WEA message

Live WEA

- Informs the public of an actual impending disaster or event
- Mentions the disaster and what should be done for the public’s safety

How to Send an Alert with AlertSense

AlertSense is similar to the WEA software Hawaii used in 2018



AlertSense

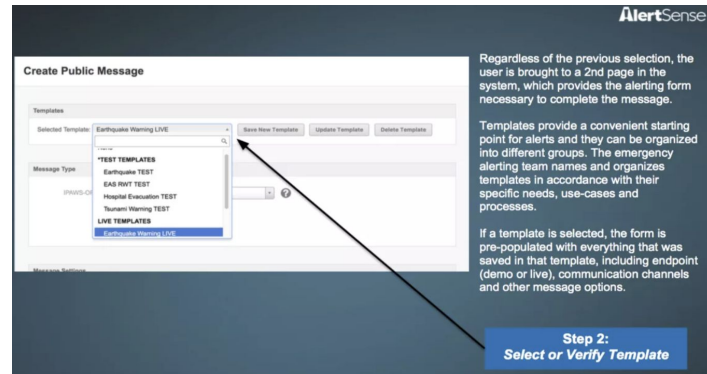
IPAWS Experience

Once logged into the system, this Dashboard is shown.

The user can review recently created templates, history, verify connection to IPAWS and initiate a public message.

Since this system is permission based, some users may see more information than others.

Step 1: Select Send A Public Message



AlertSense

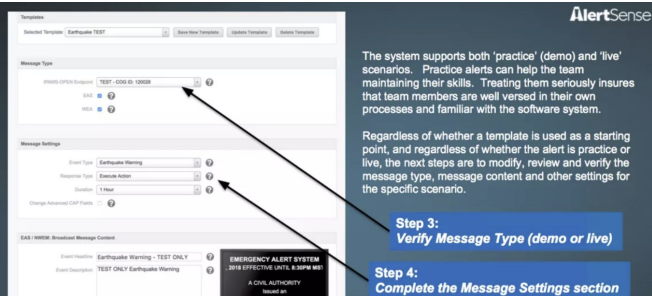
Create Public Message

Regardless of the previous selection, the user is brought to a 2nd page in the system, which provides the alerting form necessary to complete the message.

Templates provide a convenient starting point for alerts and they can be organized into different groups. The emergency alerting team names and organizes templates in accordance with their specific needs, use-cases and processes.

If a template is selected, the form is pre-populated with everything that was saved in that template, including endpoint (demo or live), communication channels and other message options.

Step 2: Select or Verify Template



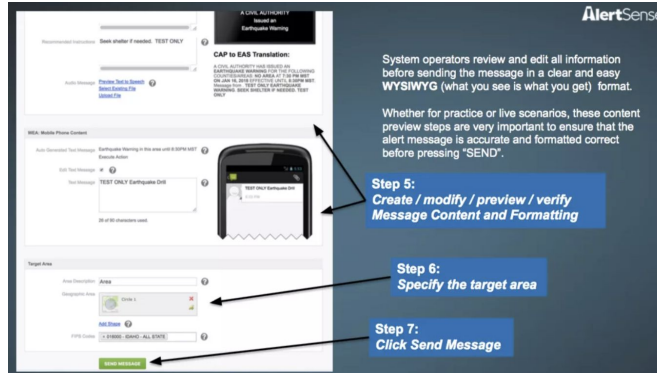
AlertSense

The system supports both 'practice' (demo) and 'live' scenarios. Practice alerts can help the team maintaining their skills. Treating them seriously ensures that team members are well versed in their own processes and familiar with the software system.

Regardless of whether a template is used as a starting point, and regardless of whether the alert is practice or live, the next steps are to modify, review and verify the message type, message content and other settings for the specific scenario.

Step 3: Verify Message Type (demo or live)

Step 4: Complete the Message Settings section



AlertSense

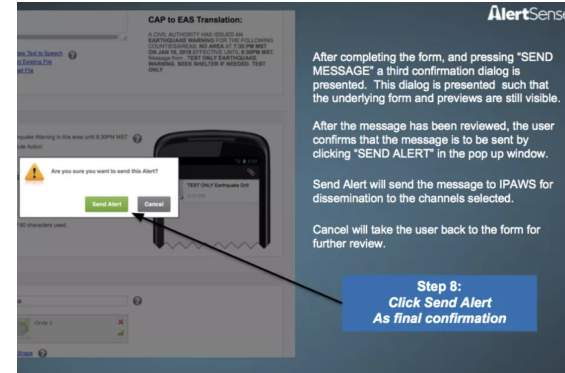
System operators review and edit all information before sending the message in a clear and easy WYSIWYG (what you see is what you get) format.

Whether for practice or live scenarios, these content preview steps are very important to ensure that the alert message is accurate and formatted correct before pressing "SEND".

Step 5: Create / modify / preview / verify Message Content and Formatting

Step 6: Specify the target area

Step 7: Click Send Message



AlertSense

After completing the form, and pressing "SEND MESSAGE" a third confirmation dialog is presented. This dialog is presented such that the underlying form and previews are still visible.

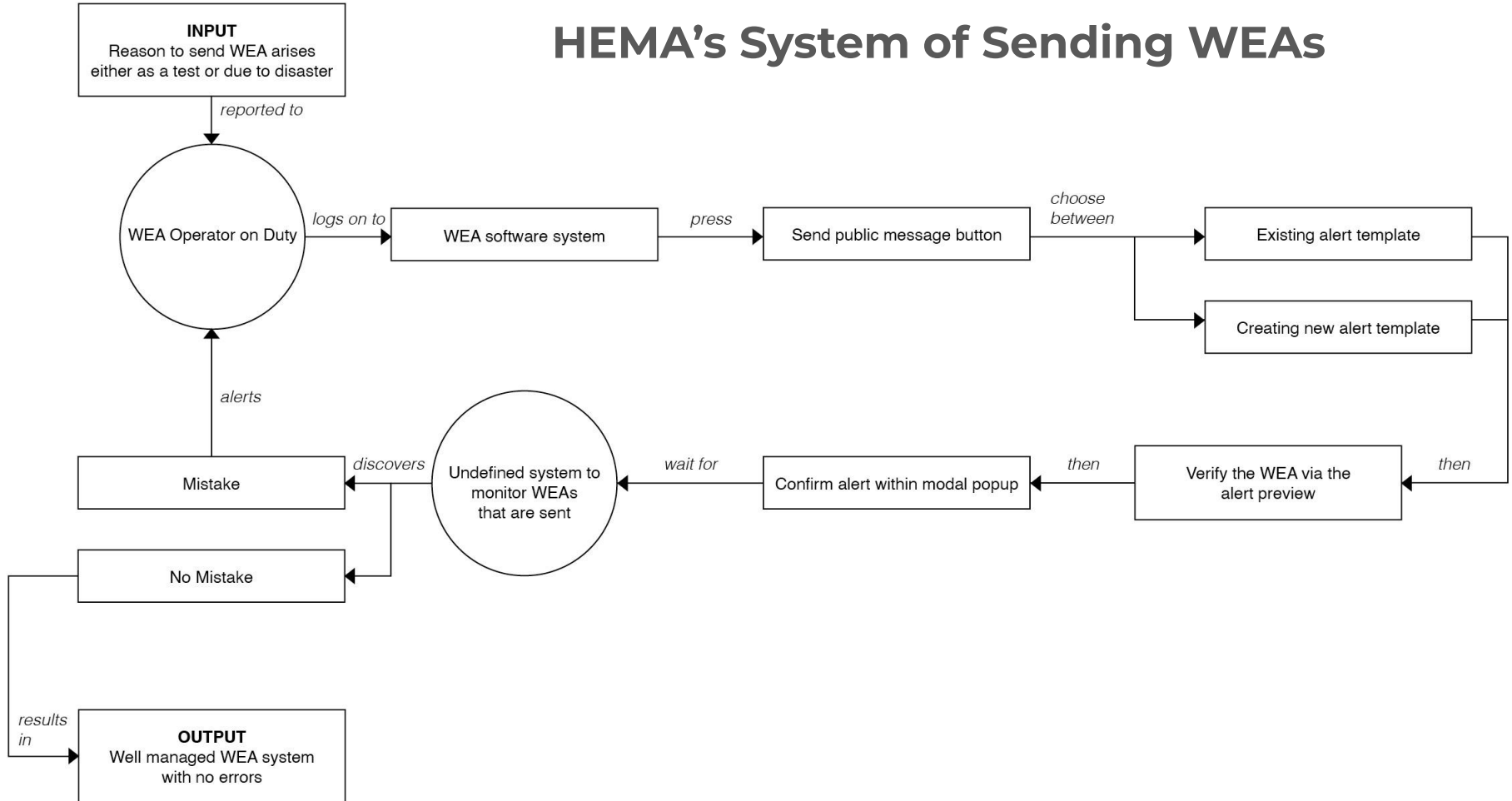
After the message has been reviewed, the user confirms that the message is to be sent by clicking "SEND ALERT" in the pop up window.

Send Alert will send the message to IPAWS for dissemination to the channels selected.

Cancel will take the user back to the form for further review.

Step 8: Click Send Alert As final confirmation

HEMA's System of Sending WEAs



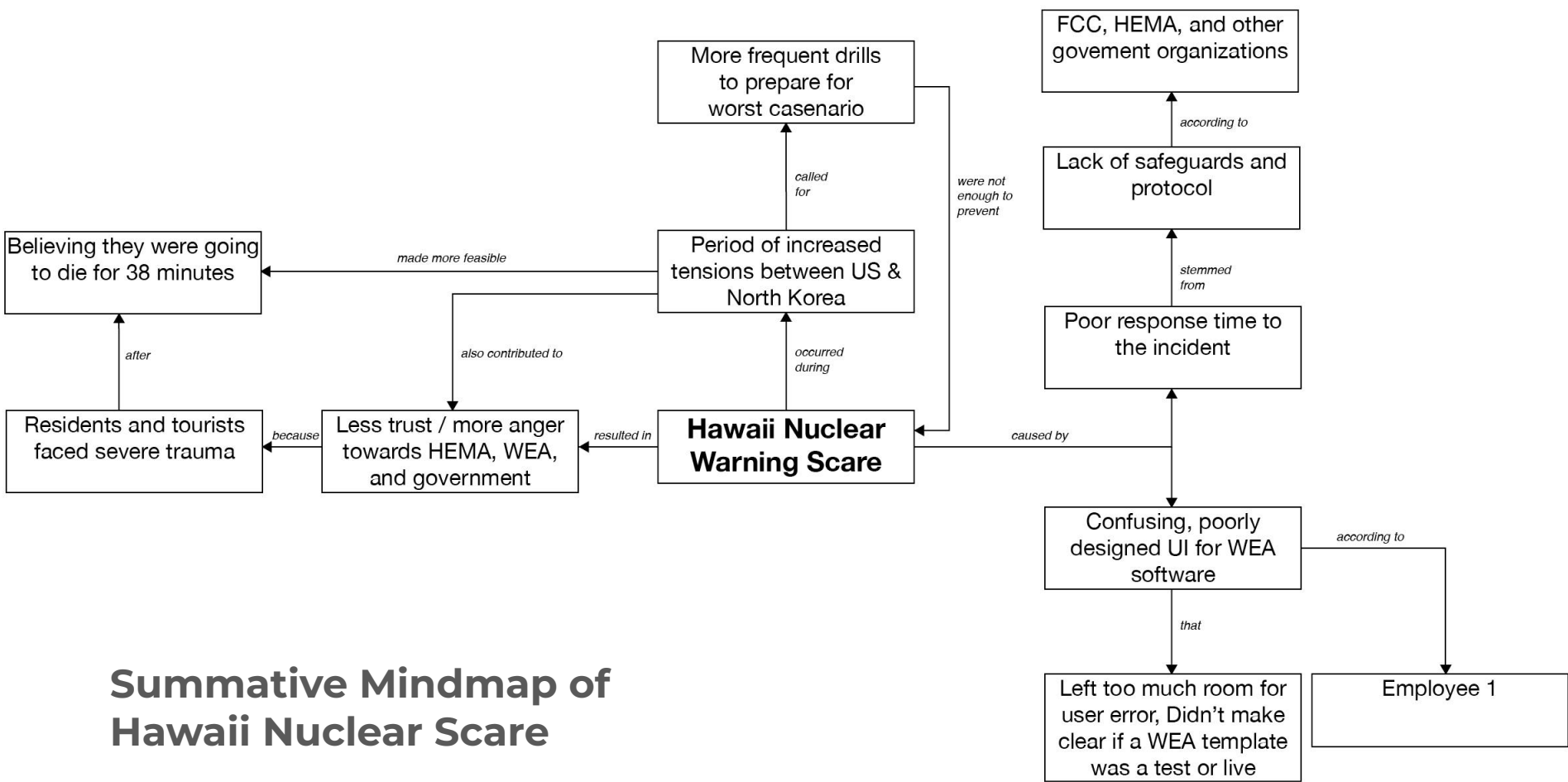
The Sources of the Problem

Poor UI Design

- Operator had to choose demo alert from a drop down menu with poorly named selection options
- The difference between a demo vs live WEA was not made clear by the software

Lack of Safeguards

- Following the event, it took too long to catch the mistake and correct it
- HEMA tweeted that the WEA was a demo 13 minutes after, but could not send out an official false alarm WEA in a timely manner



Summative Mindmap of Hawaii Nuclear Scare

How can we improve the processes surrounding wireless emergency alerts to reduce the chance of error and keep the public well informed?

Accident Proofing WEA Software UI

Major Issues with WEA Software UI

Issue	Evidence	Solution
Template names are responsible for communicating message type	Poor naming choices by operators that don't highlight demo vs live type	Create a single template for each event, then choose live or demo when sending
Previews for live alerts do not appear different from demo alerts	Demos previews often appear similar to live previews at quick glance, only distinguished by mention of "test"	Require preview to better emphasize message type so operator understands what they're sending
Confirmation modal does not display any preview	Operator confirmed their sending of the live WEA while believing it was a demo	Display important details about the WEA in confirmation modal, emphasize if live

Icon Distinctions for WEA Types

Visually represent message types to help prevent error through quick recognition





Live WEA



Demo WEA

Hawaii Emergency Messaging System

Active Messages		
	LIVE	Earthquake
		Expires: 05/05/2020 10:00pm
	DEMO	Hurricane
		Expires: 05/05/2020 05:00am

Template Directory		+ New
A		
Avalanche	Last Edited: 05/01/2020 10:00am	
Atomic Bomb	Last Edited: 05/01/2020 10:00am	
B		
Blizzard	Last Edited: 05/01/2020 10:00am	
D		
Derecho Event	Last Edited: 05/01/2020 10:00am	
Drought	Last Edited: 05/01/2020 10:00am	
E		
Earthquake	Last Edited: 05/01/2020 10:00am	
Environmental Disasters	Last Edited: 05/01/2020 10:00am	
F		
Flash Flood	Last Edited: 05/01/2020 10:00am	
A B D E F G H I J K L M N O P R S T U V W		

Homepage: Select desired WEA template from alphabetized and scrollable Template Directory, Active messages are easily viewed using their respective icons indicating their message type

Message Settings

Event Type

Response Type

Duration

WEA: Mobile Phone Content

Text Message

EAS/NWEM: Broadcast Message Content

Event Headline

Event Description

Template Page: View message templates without making stray edits or clicking send by mistake, Click “Prepare to Send” button to begin WEA sending process

< Cancel

Prepare to Send "Blizzard"



DEMO



LIVE

You have chosen a **LIVE ALERT** type which will inform the selected area below of the **impending disaster**.

Message Settings

Event Type

Winter Weather

Response Type

Execute Action

Duration

1 Hour

WEA

EAS

WEA: Mobile Phone Content

Text Message

Extreme winter weather has been reported. Please take shelter.

EAS/NWEM: Broadcast Message Content EAS Currently Deselected

Event Headline

Blizzard Warning

Event Description

WEA: Mobile Phone Content

Text Message

Extreme winter weather has been reported. Please take shelter.

EAS/NWEM: Broadcast Message Content EAS Currently Deselected

Event Headline

Blizzard Warning

Event Description

Extreme winter weather has been reported. Please take shelter.

Target Area

Area Description

Blizzard Warning

Geographic Area



Circle 1



Confirm and Send

Prepare to Send: Manually select message type to prevent error through forcing decision making, Press "Confirm and Send" button when ready to send WEA after editing is complete



Confirmation Modal: Shows clear preview of message that will be sent, LIVE Icon + button ordering / coloring + warning statement clearly communicate the WEA type

Improved WEA Software UI

Click to View
Prototype in Adobe XD

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Hawaii Emergency Messaging System

Active Messages		
	LIVE Earthquake	Expires: 05/05/2020 10:00pm
	DEMO Hurricane	Expires: 05/05/2020 05:00am

Template Directory		
A	Avalanche	Last Edited: 05/01/2020 10:00am
	Atomic Bomb	Last Edited: 05/01/2020 10:00am
B	Blizzard	Last Edited: 05/01/2020 10:00am
D	Derecho Event	Last Edited: 05/01/2020 10:00am
	Drought	Last Edited: 05/01/2020 10:00am
E	Earthquake	Last Edited: 05/01/2020 10:00am
	Environmental Disasters	Last Edited: 05/01/2020 10:00am
F	Flash Flood	Last Edited: 05/01/2020 10:00am

A B D E F

3

Prepare to Send "Blizzard"

DEMO LIVE You have chosen a **LIVE ALERT** type which will inform the selected area below of the **impending disaster**.

Message Settings

Event Type: Winter Weather
Response Type: [Dropdown]
Execute Action: [Dropdown]
[Dropdown]
Hour: [Dropdown]

WEA EAS

Mobile Phone Content

Text Message: Extreme winter weather has been reported. Please take shelter.

EAS/NWEM: Broadcast Message Content

EAS Currently Disabled

Event Headline: Blizzard Warning
Event Description: [Text Area]

2

Blizzard

Last Edited: 05/01/2020 10:00am

Message Settings

Event Type: Winter Weather
Response Type: [Dropdown]
Execute Action: [Dropdown]
[Dropdown]

WEA: Mobile Phone Content

Text Message: Extreme winter weather has been reported. Please take shelter.

EAS/NWEM: Broadcast Message Content

Event Headline: Blizzard Warning

4

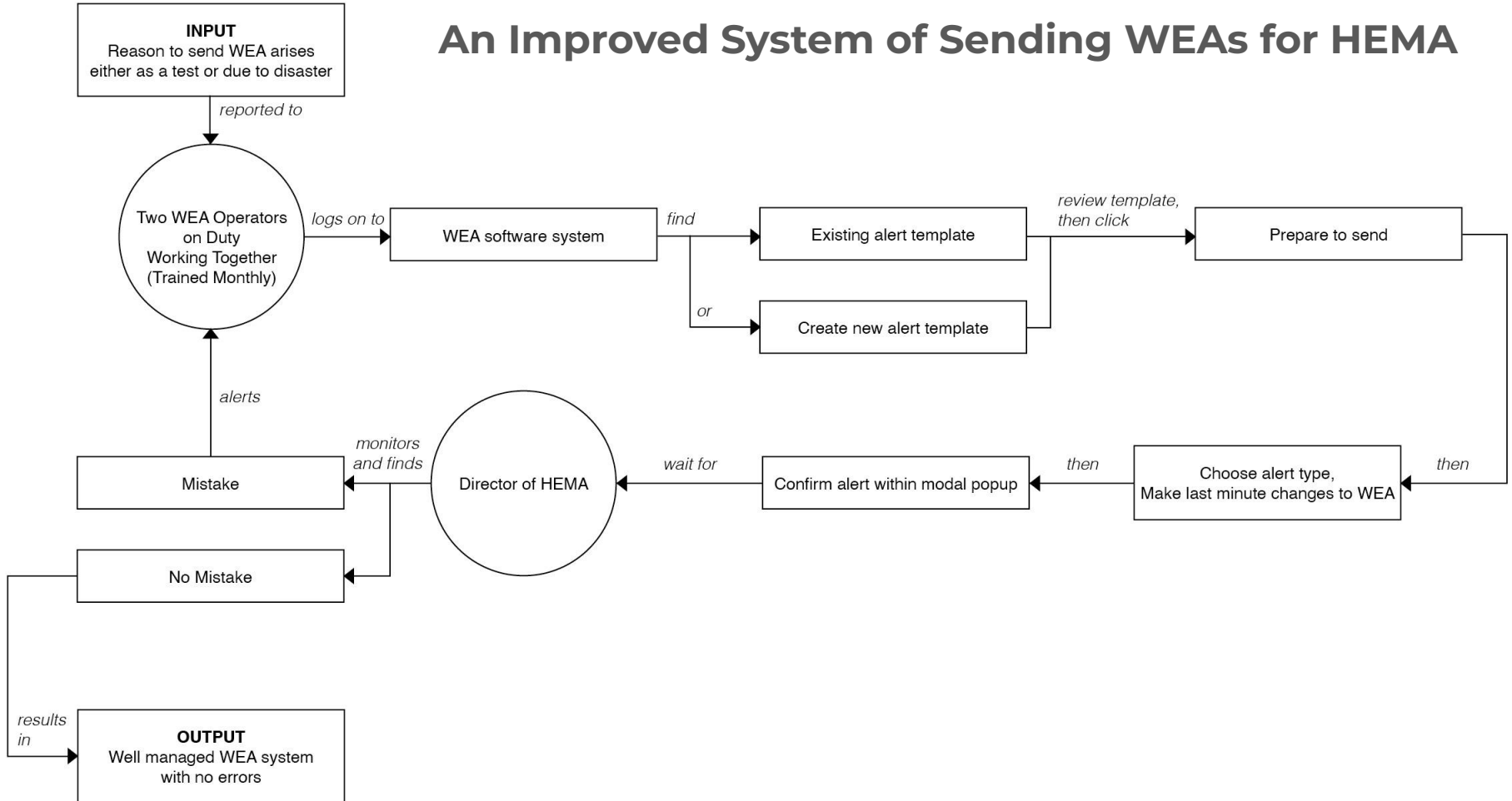
You have selected to send a **LIVE ALERT** to the selected area. Are you sure you wish to send this message at this time?

Improving Safeguards for Accident Prevention and Detection

Major Issues with System Safeguards

Issue	Evidence	Solution
Lack of monitoring of WEAs after it's sent	Operator responsible realized his error later when he checked his phone	Require two people to send the alert together to reduce chance of error
Need clearer process in place in the event of a false WEA	Took 38 minutes for HEMA to send out an alert about their mistake	Create more formalized response process in the event of a mistake
Lack of proper training	HEMA did not have regular WEA testing or training	Require more frequent WEA drills to give operators experience with the task

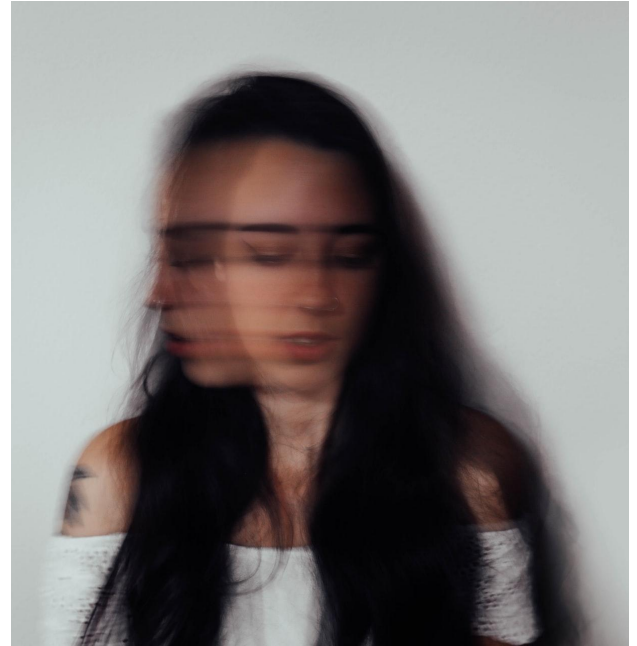
An Improved System of Sending WEAs for HEMA



A More Empathetic WEA

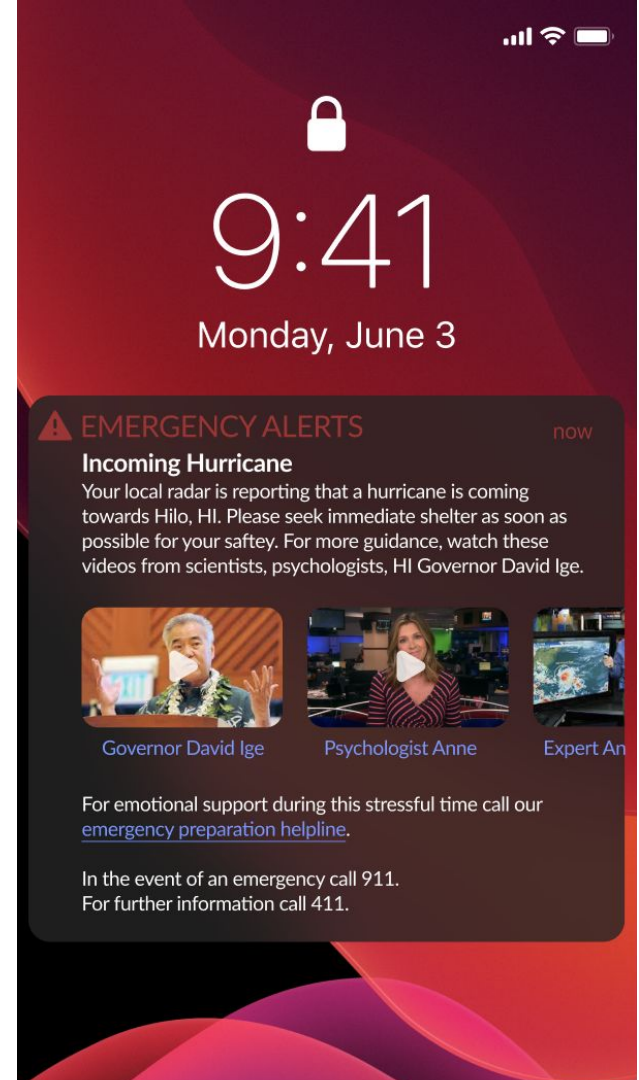
Major Issues within WEA Messaging

- Most of my solutions seek to improve the current system of sending WEAs to prevent human error
- Wireless Emergency Alerts lack empathy necessary to encourage rational, productive behavior
- Messaging must create a more productive sense of urgent preparedness rather than causing panic and stress



More Empathetic WEAs

- Instead of declaring disaster and offering minimal support to the public, this redesigned WEA offers informational and emotional resources to prevent panic
- Videos with guidance from the Governor, psychologists, and scientists offer support and information about the event from trusted sources
- Emergency preparation helpline allows recipients to speak to a representative that can help them respond to the event safely



Sources

<https://www.extremetech.com/extreme/262166-hawaiis-missile-scare-driven-terrible-ui-fcc-launches-investigation>

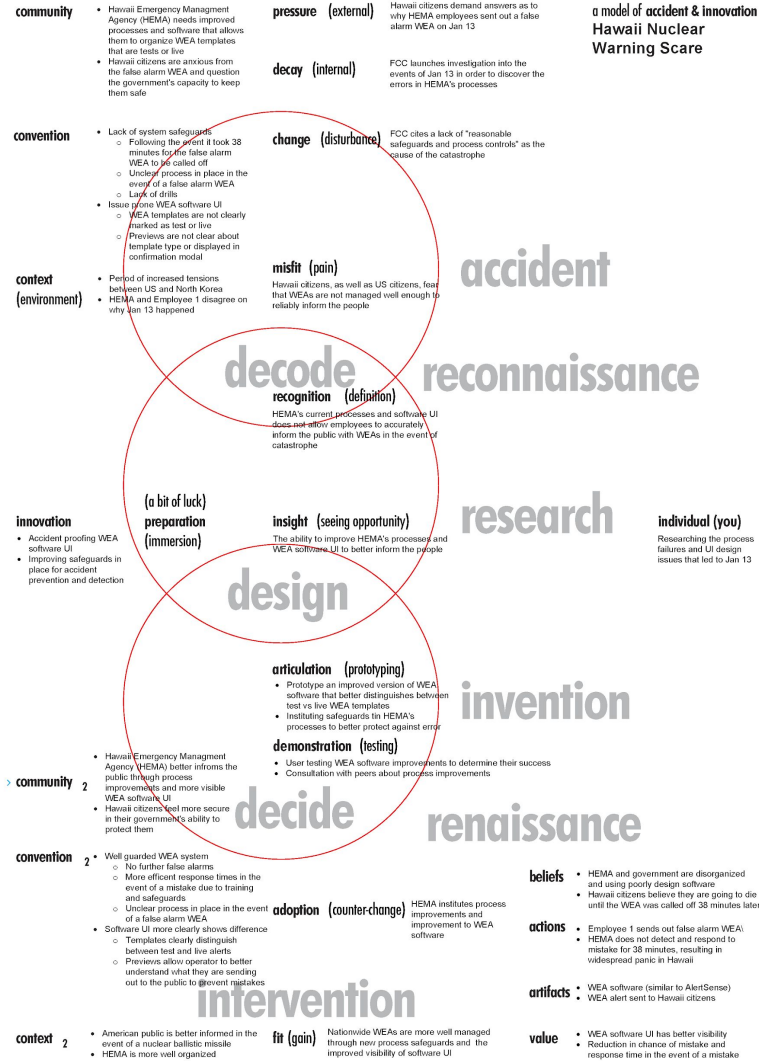
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<https://www.nytimes.com/2018/01/13/business/hawaii-missile-emergency-alert.html>



a model of innovation
Hawaii Nuclear Warning Scare

accident

reconnaissance

research

invention

decision

renaissance

intervention