

Public warning from a control room perspective

In this paper, we would like to explain why control rooms in general, and cooperation with and between control rooms specifically, play a significant role when designing an effective public warning system. We would like to emphasize three important aspects:

- Public warning is a relatively complex multi-stakeholder process,
- Interoperability with Public Safety Answering Point (PSAP) control rooms is of crucial importance,
- Special attention must be paid to system interfaces, as they represent the most time-invariant part of the system.

The predominant, simplistic narrative about public warning systems

Often, a simplistic narrative about the lifecycle of an incident within a public warning system is presented. This narrative follows a linear logic: an incident occurs, the information is received by the public authority, the risk is evaluated, a public warning is issued, citizens receive the warning message, the incident gets resolved, and once everything is fine, citizens receive an all-clear message.

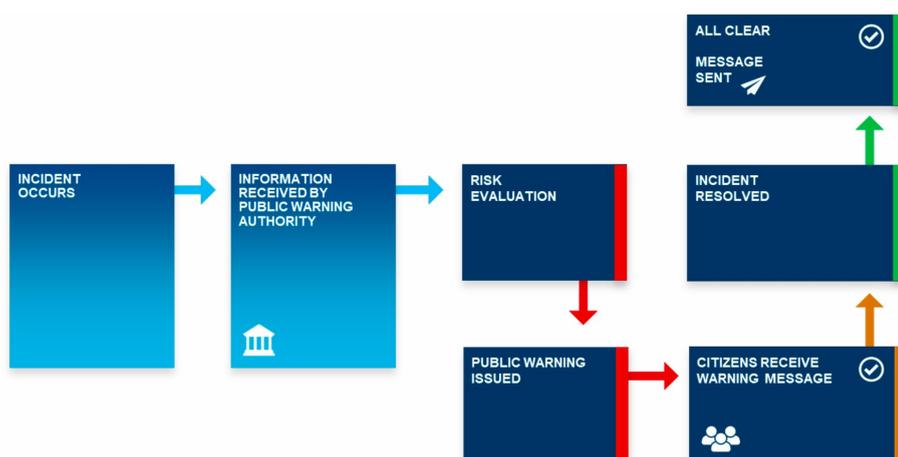


Figure 1 - Simplistic narrative about the life cycle of an incident which necessitates public warning activities

The chain starts with the incident, and the public warning control rooms somehow “magically” become aware of it. After that, there is a straightforward chain of information, incident resolution and all-clear message.

Public warning is an iterative multi-stakeholder process

However, in reality, the process is more complex. Let’s stop at the very first point, when the incident occurs. How does the public warning control room know that an incident occurred? Typically, the control room will have instrumental sources of information, such as sensors. They will also get information from other agencies and peer organizations. Every public warning organization is hoping to get the information before the news channels spread the message. Therefore, it is important to find ways to ensure that they receive the relevant information as fast as possible.

So, what is the ultimate source of information? Well, the first people who will have the information are simply the citizens who are at the spot. They will see that something is happening, they will call 1-1-2 (9-1-1), and thus the PSAP’s control rooms will be informed. Of course, the first responders in the field may also be among the first persons to know that something is going on. Citizens and first responders are therefore often the most important sources of information, and both are – via the PSAP and first responder radio functionalities – connected with the PSAP’s control rooms.

Once the control rooms have obtained the initial information, the chain continues. The risk is evaluated, a warning notification is created, the public warning message is issued, the incident is monitored. At regular intervals, the risk is re-evaluated, warning information is updated and if necessary, another warning message is issued. At this point there is a sort of loop, a recurrent process in which the incident is constantly monitored, and information from the field is needed. The public warning control room once again requires updates from the first responders or from the citizens. As described before, all this information naturally ends up in the PSAP control rooms. Finally, the incident will get resolved and the all-clear message can be sent.

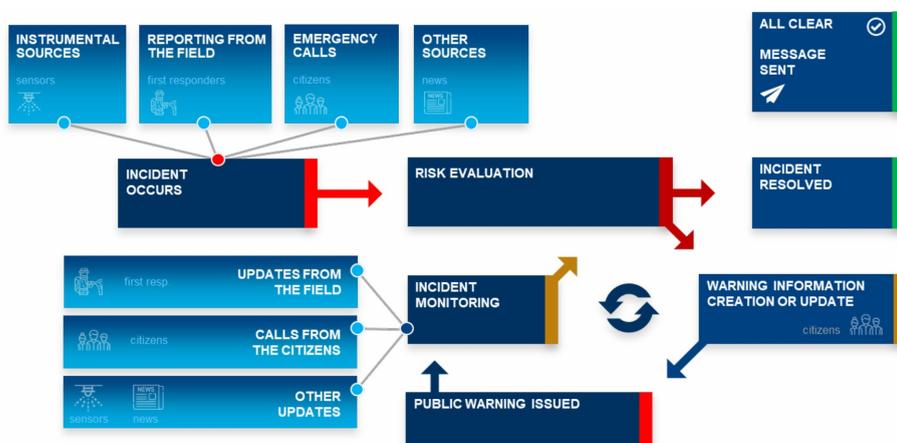


Figure 2 - The actual public warning life cycle

Interoperability is the key

As mentioned above, the most valuable information will come from the first responders and from the citizens who communicate to the PSAPs. However, the public warning control rooms are often not part of the same organization as the PSAP control rooms. So how do the public warning control rooms obtain the necessary information? The answer to this organizational challenge is that they need to be interoperable with the PSAPs: they need to connect with the regular day-to-day incident management control rooms for fire, police, ambulance and other emergency services. Only once the information flows between the different control rooms are established, can the public warning channels effectively be utilized. A corollary of this realization is that when designing the public warning system, the interoperability between public warning control rooms and the PSAPs must closely be taken into account. This is necessary both from the process and from the technical perspective.

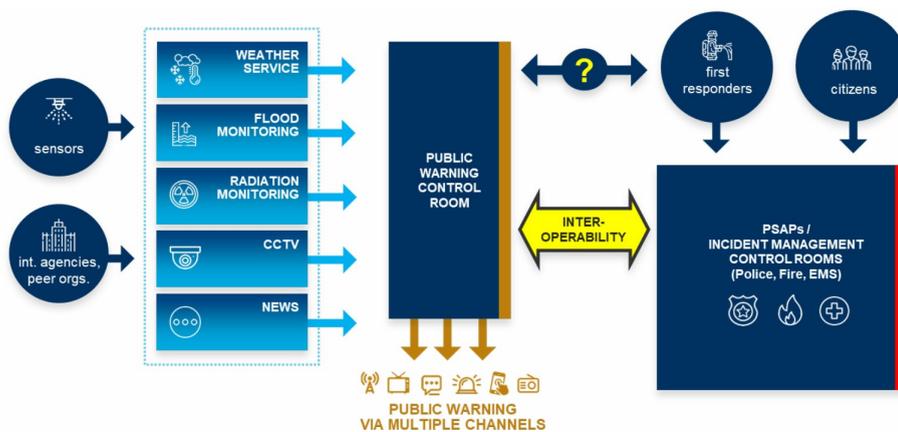


Figure 3 - Interoperability between control rooms

Interfaces design your system

Designing and creating a public warning system is a multi-year process. It is not about purchasing out-of-the-box solutions, but rather about carefully designing the overall system. This means thinking about the interfaces and the protocols between the individual components, as those interfaces and protocols represent the most time-invariant parts of the system. The “boxes” can be exchanged later if necessary, but the interfaces and protocols defined at the start are usually here to stay. Therefore, we advocate designs which are based on open standards, and which do not lock stakeholders into proprietary solutions throughout the lifetime of the system.

Conclusion

In this article, we have provided a holistic perspective on public warning systems from the perspective of an internationally leading control room vendor. We have articulated three important facts about creating effective public warning systems:

First, we have established that public warning is a relatively complex multi-stakeholder process. Therefore, it is necessary to handle the entire

lifecycle of the incidents in a manner that takes both complexity and stakeholder management into account.

Second, we have seen that interoperability is key: the public warning control rooms need to be seamlessly interconnected with the PSAPs. Failing to do so may lead to the dissemination of outdated – and therefore potentially counterproductive – information. Citizens who receive an alert related to an incident which they have already seen on the news – and which may have already passed – may lose faith in the public warning system and pay less attention to public warnings in the future.

Third, we have stressed that the interfaces are the most time-invariant part of the overall system. The individual subsystems may change over time, but the interfaces and protocols normally do not change over the lifetime of the system. Therefore, these mission-critical systems should be designed properly from the outset.

As a global control rooms champion with nearly three decades of experience in public safety, Frequentis is able to design entire public warning ecosystems in an open and sustainable manner. We invite interested stakeholders to engage with us in a dialogue which will result in substantial benefits for the safety of their citizens.

When designing and creating an effective public warning system, it is an advantage to work with a partner who has decades-long experience with control rooms in public safety.
