

## Carrier Outages - Planning for the PSAP

### A Best Practice Guide

This best practice guide is intended to provide advice on unplanned carrier outages and mitigating impacts on Public Safety Answering Points (PSAPs) and the public. Through the Collaborative Coalition for International Public Safety (CC:IPS) it draws on global experience to increase awareness and readiness before any incidents affecting emergency calls occur. It is important to note that regulations and capabilities differ across the world, thus, when applying this information, it is vital to consider potential variations and limitations that may be present in your region.

Communication service disruptions, also referred to as carrier outages, that could affect homeland security, public health, or safety are of primary concern in public safety. Outages may vary widely in scale, ranging from local to national impacts. Events can stem from factors such as aging infrastructure, physical damage to network components, equipment failures, configuration errors, or cyber breaches, among others. Having a sound knowledge of the infrastructure through which your organization receives emergency calls and developing an understanding of the potential impact of the events is crucial for mitigating risk and ensuring adequate preparation when an outage affects your PSAP.

Early notification of a carrier service disruption can be useful to the PSAP, however notifications may or may not occur before the PSAP recognizes there is a problem. Depending on the country, carriers may be subject to specific regulatory requirements aimed at ensuring timely notification and resolution of issues. These requirements may include obligations to notify the regulatory body responsible for oversight of communication systems within their respective jurisdictional boundary. In many cases there is a focus on notifications to regulatory bodies where fines and/or the direction to implement corrective measures may ultimately result, but little is achieved in mitigating the immediate effects of a failure. It is crucial to ensure effective communication between PSAPs and telecommunications regulators so that PSAPs fully understand the relative priority of notifications, in accordance with regulatory requirements, before events occur.

Requirements should include carrier notification to affected PSAPs if a disruption has affected or could affect the ability to receive calls via three-digit emergency number dialing. Notifications are generally determined by the nature and scale of the incident.

Notifications of outages are useful for many reasons. Notifications are intended to minimize confusion, manage expectations, and support effective response, i.e. the return to normal service. While timely notifications of disruptions are important, they can also cause problems for PSAPs where there is a lack of standardization, minimal useful information and overly frequent notifications. Before events occur, work should be done to address these challenges.

Notifications frequently stem from carriers exercising an abundance of caution and often communicate an issue that may affect multiple PSAPs across a wide geographic scope. This can result in PSAPs being included in a notice but not affected at all.

Regardless of whether a country has carrier outage notification requirements, outages may occur unexpectedly and without prior notification. The absence of alerts and information regarding the outage location can pose challenges for PSAP personnel in determining the origin of the issue and contacting the relevant carrier(s). This consumes valuable time and resources for PSAP staff, increasing stress, particularly in what is likely an already stressful situation, and may ultimately delay the return to normal service.

Determining the scope of impact on a PSAP is crucial for developing an effective response strategy. When an outage occurs, PSAPs should assess the severity of the impact to accurately determine the extent of the issue, assess potential mitigations and decide on appropriate next steps. A well-considered plan, which details the various stages of the call transfers processes and thoroughly evaluates potential actions, drafted in advance will assist when creating a comprehensive Incident Action Plan (IAP). A well-structured IAP can help mitigate the disorder and stress that often accompanies service disruptions, maintaining better control and a faster return to normal operations.

The creation of an IAP and preplanning may involve coordinating with:

- service providers,
- emergency operations personnel,
- PSAP staff,
- public information officers,
- carrier representatives, and
- other relevant stakeholders.

The composition of stakeholders may differ depending on the country and emergency communication system environment configuration. Inviting key stakeholders to participate should result in a well-orchestrated plan that considers diverse perspectives. Moreover, it facilitates the development of clear expectations and the assignment of roles and responsibilities, which are essential components of the IAP. In many jurisdictions committees or bodies have been established to bring together the key stakeholders listed above to ensure that relationships are established which will help in the event of an issue and to discuss matters which may assist in preventing outages in the first place.

While it is impossible to foresee every conceivable scenario, planning should include a range of situations based on risk, impact and probability, and outline strategies to effectively address as many as possible. In addition to IAPs tailored to specific types of incidents, developing and implementing training programs for PSAP personnel and designing public education initiatives are crucial strategies which contribute to a smoother management of outage incidents.

As noted previously, a thorough grasp of an incident is crucial. This can be accomplished by documenting and evaluating events as they occur. Gauging the severity of an incident by verifying whether a failure has impacted the ability for callers to make calls to the three-digit emergency number or prevented emergency calls from being received at the PSAP is the first step.

Some questions to consider during the incident assessment:

- If the outage affects the ability of callers to make a call to the three-digit emergency number from their device:
  - Who is the carrier?
  - Who is the device manufacturer?
- If the outage affects the ability of the PSAP to receive three-digit emergency calls?
  - Are any calls being received?
    - If so, from what location or carrier?
  - Is the issue intermittent?
  - Can the issue be narrowed to a specific carrier?
  - Is the outage specific to one carrier or has it impacted multiple carriers?
  - Is the ability to receive 911 location on tactical mapping solutions affected?

- Was a notice issued by the carrier and what is the status of that notification?

Clear and measurable objectives should be established for a successful response to these types of events. Objectives may include but are not limited to:

- Ensuring that emergencies can be reported by those experiencing the emergency whether by dialing the three-digit emergency number or other available option.
- Ensuring that reports of emergencies can be received, whether by three-digit dialing or other available option.
- Minimizing public uncertainty and dispelling fear.

The latter point can be planned for in advance and there are two key aspects:

- Determining the messages that will be given to the public in each situation, and the means or agencies for which they will be distributed.
- Determining the most appropriate individual who will make the decision to implement the plan – having a clearly identified lead(s) who will decide when to implement a message or messages will ensure that there is less risk of nobody making that decision.

Accessing emergency services by dialing a three-digit emergency number may not be feasible in certain situations and individuals attempting to contact emergency services might be unaware of the reasons why. Potential causes could include:

- disruptions within the caller's carrier network or
- widespread network outages affecting multiple carrier networks (including the caller's network provider).

Additionally, local network issues or equipment failures may impact the delivery of three-digit calls. Some disruption scenarios may be further impacted by the size and/or scope and so should be considered in the planning based on risk and probability of occurrence.

The insights gained from post-incident assessments and defining a set of clear response objectives will assist PSAPs and other stakeholders to effectively respond to incidents outlined in the plan. Specific actions which can be considered before or during an outage may include:

- Providing alternate methods for the public to reach emergency services, such as:
  - Monitoring social media accounts.
  - Offering text services where available
  - Providing alternate short or long (generally 3 or 10 digit) numbers.
- Implementing alternate routing of three-digit emergency calls:
  - Using a pre-designated call center with an Interlocal agreement.
- Relaying emergency call information or direct dispatch:
  - Utilizing PSAP to PSAP radio call relay, phone, or messaging capabilities.
  - Sharing agency radio channels for direct dispatch of emergency calls.
- Actively monitoring tactical mapping solutions to provide location information of callers attempting to reach three-digit emergency service numbers:
  - Initiating service calls based on the obtained location information.
- Reaching out to providers as needed for information and updates.
  - Maintaining a list of Network Operations Centers (NOCs) contact numbers and escalation procedures.
- Providing initial outage notification to the public with subsequent updates as appropriate to the situation or event:
  - Establishing specific thresholds for public notification, including detailing who will decide when to implement.
  - Establishing means of public notification (social media, media partners, notification systems).
  - Using predetermined canned messages for release.
  - Determining the frequency of updates.
- Notifying 911 authorities and stakeholders of the disruption:
  - Determining when notifications need to be made.
  - Identifying who needs to be notified.
  - Compiling a list of contact numbers for stakeholders.
  - Setting the frequency of required updates.

- Initiating incident tracking for extended outages:
  - Identifying types of information required to be tracked.
  - Assigning responsibility for maintaining this information.
- Implementing the after-action plan or review:
  - Examining in detail events that occurred.
  - Assessing what elements of response worked and what needs improvement.
  - Determining what could be done differently.

The information in this document is not intended to be exhaustive, however experience gained across the globe has ensured that it provides a useful starting point. Keep in mind that capabilities may vary based on the agency or country. Additionally, an incident may change in size and scope and therefore any incident plan should allow for scalability.

This document has been written on behalf of CC:IPS. Additional resources are located on the [CC:IPS webpage](#).

### **About CC:IPS:**

On 4th November 2019 public safety organizations signed a first-of-its-kind agreement to work together to improve the emergency communications systems that serve nearly one billion people worldwide.

Under the pact, known as the Collaborative Coalition for International Public Safety CC:IPS, APCO Canada, EENA, British APCO, and NENA pledge to promote, support and improve emergency communications services utilizing the most current and commonly accepted technologies, standards, and best practices. More recently, the coalition has grown to include, amongst others, the NECWG – Australia & New Zealand (NECWG-A/NZ) and the Organisation of American States which brings together all 35 independent states of the Americas.

The groups have committed to promote, among a wide range of topics, Next Generation emergency communications, services, networks and systems such as the i3 standard for NG9-1-1 in North America and the NG1-1-2 standard in Europe.