Australian Government
Department of Infrastructure, Transport,
Regional Development, Communications and the Arts

Review into the Optus outage of 8 November 2023 – Final Report

March 2024

February 2024 / INFRASTRUCTURE 2024

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Letter of Transmittal

The Hon Michelle Rowland MP
Minister for Communications
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Parliament House
CANBERRA ACT 2600

Dear Minister

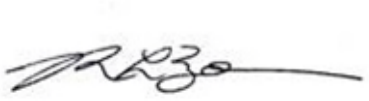
I am pleased to present the Final Report of the Review into the Optus outage of 8 November 2023.

This Review involved consultation with a range of stakeholders including telecommunications providers, Commonwealth, state and territory government entities, industry organisations and consumer representative bodies. We received 30 submissions, and met with over a dozen organisations. I thank everyone who contributed to the Review and acknowledge the considerable undertaking this represents. The breadth and depth of information provided has proven invaluable in reaching the recommendations in this Final Report.

The Optus outage had a significant impact on a wide range of Australians, affecting emergency services, government services, businesses and vulnerable people. Telecommunications have become fundamental to everyday life and the outage was a source of great frustration and distress for many. While the Review considers the existing telecommunications ecosystem to be functional and generally meets the needs of the community, the outage offers an opportunity to learn and improve to reduce the chance of future outages and lessen their impacts, particularly on the provision of emergency services.

The Final Report includes 18 recommendations within scope of the Terms of Reference of the Review. These recommendations address structural issues within the broader telecommunications ecosystem and will require ongoing communication and collaboration between governments and industry to ensure an effective and consistent framework for managing and responding to unanticipated network outages.

Yours sincerely



Richard Bean
Lead, Optus Review

21 March 2024

Introduction and Executive Summary

A robust and reliable telecommunications system is essential to the proper functioning of Australian society. The telecommunications landscape has evolved dramatically over the last three decades and its role as an enabler of modern life has grown over that time. The fixed line telephone has given way to high speed broadband, and more recently, the establishment of the smart phone as the nexus to all aspects of our lives.

Australia's telecommunications networks underpin essential government, public health, and safety infrastructure. They support critical services for consumers and businesses and facilitate almost every aspect of our everyday home and work lives. What we have come to expect from our telecommunications services has been shaped by this reliance.

On 8 November 2023, this system received a shock, when the Optus network suffered a national outage. Emergency services were compromised. Hospitals were hampered in their critical work. Businesses lost the ability to trade. Transport networks were disrupted. These breakdowns posed real risks to personal health and safety, resulted in the loss of income and productivity and caused widespread distress in many parts of our community.

Following the outage, the Australian Government announced that the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (the Department) would conduct a Post Incident Review, led by Mr Richard Bean, of what industry, government and the community can learn from the event, with a specific focus on emergency calls, along with customer communications, complaints handling and compensation processes.

This, of course, isn't the first outage of this kind, and no network will ever be fully immune from technical faults or outages. However, it has become apparent that what has been learned from previous outages has not always been universally understood, and we must take this opportunity to learn what lessons we can from this serious incident so we can address underlying issues that were exposed by the network outage and provide the Government with recommendations for reform.

As required by its Terms of Reference, the Review has focussed on the functioning of Triple Zero during the outage, the role of government in managing and responding to national service outages, the adequacy of requirements for customer communication in national service outages, the adequacy of customer complaints and compensation processes following the outage, and other telecommunications sector implications.

As far as possible this focus has at all times been applied from the perspective of ordinary citizens reliant on our telecommunications networks and who may at any time need to call Triple Zero.

The Review has not considered whether Optus complied with current regulatory obligations, including the Telecommunications (Emergency Call Services) Determination 2019[1] (the ECS Determination). The Review acknowledges that this is a matter for the independent regulator, the Australian Communications and Media Authority (ACMA), which has been undertaking an investigation into Optus's compliance with the existing regulatory framework, including the rules requiring that emergency calls are successfully carried from mobile carriers to the Emergency Call Person (ECP), Telstra.

In addition, the technical causes of the outage or the adequacy of the value of any compensation offered by Optus are outside the scope of this Review.

The focus of this Review has therefore been on identifying gaps and flaws in the system, as opposed to apportioning blame or getting to the bottom of technical complexities. This Report does, however, include information about the outage from a technical point of view, and Optus' actions in addressing those issues.

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[1] See Federal Register of Legislation - Telecommunications (Emergency Call Service) Determination 2019

It is important to note that Australia's system of emergency calling and emergency services response functions extremely effectively for the vast majority of the time. The system is not fundamentally broken, but the Review has found that important improvements can and should be made.

The Review drew on the knowledge and experience of a broad range of industry participants, experts and private citizens including telecommunications providers, consumer groups, business groups, regulators, the Telecommunications Industry Ombudsman (TIO), Australian Government, state and territory agencies, emergency services and international counterparts.

The Review has sought to articulate how existing arrangements are intended and understood to function and how they worked in practice during the outage. In doing so, the Review seeks to identify gaps in formal and informal arrangements, rules and processes that should be addressed to better guard against future events and ensure those events when they occur can be handled in a manner that results in the least disruption possible to peoples' lives and the services they depend on.

As part of these investigations, the Review also looked at what happens in other countries and other essential services sectors when they experience outages to see if these lessons could be applied to Australia's telecommunications sector.

This report sets out the combined results of these investigations, and the recommendations seek to address the issues we have identified in a way that will improve the future functioning of the system.

This report makes 18 recommendations in all, relating to each of the Terms of Reference, with a focus on establishing a framework for the management of telecommunications outages that:

- Actively seeks to limit outages and their impact through whole-of-ecosystem testing and a structured approach to learning lessons from domestic and international experience
- Ensures our Triple Zero service is robust and that our telecommunications networks and devices are configured as far as possible to carry Triple Zero calls on alternative networks, where available, during outages
- Ensures key players in the telecommunications ecosystem know their roles, and have efficient and effective arrangements in place for communicating, sharing information, collaborating and assisting each other to manage major outages and maintain citizens' access to Triple Zero
- Ensures that the community is kept informed about outages, and customers have access to strong complaints mechanisms and compensation processes where they are affected by a major outage
- Better prepares Australian governments, the community, organisations and businesses for outages.

There is a great deal we can learn from this outage. We need to act on and implement what we have learnt to ensure that Australia is better prepared for future outages and, most critically, that the Emergency Call Service is delivered within a robust and reliable framework.

Recommendations

TOR 1 – Functioning of Triple Zero

1. Mandatory requirements should be put in place, by augmenting existing requirements or otherwise, to:

- More clearly and explicitly articulate precisely what is expected of network operators in regard to ensuring calls are delivered to Triple Zero
- Include specific obligations that network operators wilt towers in the event of loss of connectivity to a core network, ensuring calls to Triple Zero can be carried by other networks.

2. Establish a Triple Zero custodian, with oversight of and overarching responsibility for the efficient functioning of the Triple Zero ecosystem, including monitoring the end-to-end performance of the ecosystem.

   There are a number of ways this could be achieved, including by establishing a new body or enhancing the role of an existing body. It would not be a regulatory function: where matters were identified for change, existing bodies would be responsible for implementation.

3. To ensure (to the extent possible) continuous access to Triple Zero, carriers must conduct 6-monthly end-to-end testing of all aspects of the Triple Zero ecosystem within and across networks. The end to end detection testing should include:

- Network functionality and capability during outages of various types
- Behaviour of all known devices in different circumstances
- Interoperability of all parts of the ecosystem (from originating carrier, to ECP, to ESO answering point) during outages.

   Any identified deficiencies must be reported to the ACMA and be accompanied by a remediation plan with timetable.

   This requirement should be mandated in a standard or determination.

4. If this testing does not include devices supplied by the customer (i.e. 'Bring your own device') then information should be provided to those customers warning that those devices may not have been tested in emergency scenarios.
5. Require carriers, through a standard or determination, to share real time network information detailing outages with relevant emergency services organisations and other appropriate entities, including the body referred to in Recommendation 2.
6. Require providers, through a standard or determination, to report to the ACMA and the Department, within a mandated timeframe after a major outage, detailing its causes, steps taken to resolve it, the impact on Triple Zero, and a clear and detailed plan, with timeline, to address issues identified and avoid similar outages in the future.
7. Combine and expand existing disruption protocol instruments to cover all matters relevant to outages in any element of the Triple Zero ecosystem.

   There are currently multiple obligations related to actions taken during and after network disruptions. Combining these obligations in one document and ensuring they cover the system from end to end would greatly improve understanding and clarity of responsibility.

8. The Department should review the contract under which Triple Zero is delivered, with a specific focus on the central role of the ECP within the ecosystem.

   The review should consider, in light of the recommendations of this Review relating to the Triple Zero ecosystem, including Recommendation 2, governance structures, and separating financial matters from other ECP obligations.

TOR 2 – Role of government in managing and responding to a national service outage

9. The Protocol for Notification of Major Service Disruptions (the Protocol), should be improved and augmented with clear and detailed requirements for Government communication and collaboration during telecommunications outages through a central coordination point in Government.

   This should cover communication and collaboration with carriers, relevant Ministers, Commonwealth, state and territory government agencies, TIO, the Australian Consumer and Competition Commission (ACCC), ACMA, Emergency Service Organisations (ESOs) and other relevant parties.

   The Protocol should also be closely aligned with the Australian Government Crisis Management Framework (AGCMF) and the National Coordination Mechanism (NCM).

TOR 3 –The adequacy of requirements for customer communication in national service outages

10. The ACMA should develop a standard or determination requiring carriers to communicate specific information to customers during and about outages. The Communications Alliance Emergency Communications Protocol – Industry Guideline G663:2022[2] or one or more of the carriers' existing internal communications protocols could be used as a base but there needs to be an explicit focus on communications between the affected network provider and its customers as well as other stakeholders.
11. The Department should develop further and promote the educational initiatives developed in 2020-2022 to assist the public, businesses and other organisations to prepare for and recover from outages as a result of natural disasters. These materials should be reviewed and enhanced to apply to a broader range of scenarios including major network outages. The Department should promote these materials to the community.

TOR 4 – Complaints and compensation

12. The Complaints Handling Standard and related Record Keeping Rules should be amended to ensure they account for the impacts of network outages and that the definition of complaint in the Standard meets community expectations in relation to crisis events.
13. An industry wide standardised approach to the form of resolutions available to consumers affected by a crisis or large-scale outage should be implemented.

    This standardised approach should address the possible forms of compensation and penalties applicable to loss of service during outages, enabling the TIO to address mass events without requiring large numbers of individual complaints, investigations and resolutions. While it is not intended that this measure replace the Customer Service Guarantee (CSG), it could provide a similar framework through which outages affecting more than fixed line voice services are considered.

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[2] See G663_2022 (commsalliance.com.au)

TOR 5 – Other: Resilience and interdependencies

14. Work currently being undertaken on roaming during natural disasters should be followed by work on temporary roaming during outages caused by other events, such as those which occurred on 8 November 2023. That work should be undertaken with reference to international experience as to cost and feasibility.
15. The Australian Government should require mutual assistance arrangements to be established between telecommunications service providers during outages to assist in managing and resolving those outages, learning from international experience (for example, similar to the Canadian MOU).
16. Network operators should be required to establish the ability to remotely access and activate network management tools, and have sufficient network redundancy to deploy them, in the event of a core network outage.
17. Australian governments should review arrangements for maintaining their operations during outages including telecommunications redundancy for critical government services. Consideration should also be given to maintaining this information in a central repository.
18. The Department and the ACMA should institute a review of all legislation and regulation relating to Triple Zero, with a clear focus on the recommendations of this Review and the outcomes of the ACMA's investigation regarding the Optus outage.

Background

The Optus outage occurred on 8 November 2023, disrupting services for Optus customers and customers of Optus resellers. The outage interrupted critical services for consumers and businesses as well as essential government, public health, and safety infrastructure. The outage is estimated to have affected around 10 million customers and nearly half a million businesses.

On 9 November 2023, the Australian Government announced that it would undertake a post-incident review into the national Optus outage. The Terms of Reference are at **Attachment A**.

Separately, the ACMA is formally investigating Optus' compliance with the ECS Determination, including the rules requiring that emergency calls are successfully carried from mobile carriers to the ECP. The Senate Environment and Communications References Committee has also undertaken an inquiry into the matter.

The Outage

While this review is not specifically considering the technical causes of the outage. the following information, supplied by Optus, provides context for the matters discussed and the actions recommended in this Report in accordance with its Terms of Reference.

Optus network issues

The outage occurred when a large number of Optus routers automatically self-isolated in order to protect themselves from an overload of IP routing information. These self-protection limits are default settings provided by the relevant global equipment vendor. During a software upgrade, the Optus network received changes in routing information from an alternate Singtel peering router. These routing changes were propagated through multiple layers of the IP Core network.

As a result, at around 4:05am (AEDT), the pre-set safety limits on a significant number of Optus network routers were exceeded and connectivity with the core network was lost

Implications for access to Triple Zero

During the period of the outage the Optus network was not providing service to its customers with the exception of Optus customers whose calls were processed by the Campbellfield exchange. In a situation where there is no service available to Optus customers via the Optus network, user devices' emergency camp on feature should operate, enabling them to access Triple Zero via another operator's network.

With the loss of connectivity to the core network, Optus's 4G and 5G base stations automatically wilted (shut down), as a measure to ensure that user devices would camp on to other available networks, due to the lack of signals from the home network. Optus reports that its 4G and 5G sites automatically wilt in situations where base stations lose transmission connectivity to the core network.

Optus's mobile network was also not providing service through its 3G base stations, but the 3G radio units were still radiating signals. 3G radio units did not automatically wilt as these sites maintained connectivity to the core network through a voice channel which remained active even though those calls were not able to progress to Triple Zero due to the failure of the core network.

Some devices detected that 3G radio units were radiating and attempted to make emergency calls via those towers (rather than look to camp on to another network), even though no mobile service was being supplied by the Optus network. These calls received an error signal from the Optus network, which signalled the network was not in operation.

Post outage actions taken by Optus

The two root causes of Optus' inability to ensure that its customers were able to successfully call Triple Zero, through camping on to other networks, were:

- Optus' inability to reach its core network infrastructure through its Operations and Maintenance (OAM) Network or its Out of Band (OOB) Network
- Optus' inability to force the 3G radio base stations to wilt.

Optus has advised that it has assessed its readiness for a scenario similar to the outage and put in place measures to minimise the impact of a network outage on availability of emergency calling.

Should the 3G base stations behave in the same manner as was the case during the outage, Optus now has two key options it can pursue depending on the scenario.

The first scenario is where the Operations and Maintenance network is available (which was not the case on 8 November). If the OAM network is available, Optus is able to manually over-ride automatic wilting remotely, forcing it to occur.

The second scenario is where the OAM network is not available, as was the case on 8 November, when Optus did not have the ability to manually or remotely shut down the 3G Network to force the wilting of those towers.

Optus has advised that it is currently working to address these issues. The work will improve its capabilities when the OAM Network is unavailable. It will:

- Enhance its ability to restore its IP core routers to service within shorter time frames
- Enhance its ability to enact remote access to 3G core infrastructure so it can force a shutdown if automatic wilting isn't triggered.

Optus has stated that it has targeted 28 March 2024 for completion of this work.

In addition, Optus has advised that the impending 3G shut down will prevent the issues that occurred on 8 November from occurring again. This does not rule out future failures with different root causes.

A number of recommendations in this report are aimed at ensuring issues such as these are identified and considered before any future outages.

TOR 1 – Functioning of Triple Zero

Triple Zero is a free service that enables everyone in the community to make voice calls to police, fire and ambulance services in an emergency.

Triple Zero is, in practical terms, an ecosystem made up of multiple independent actors working together to provide a cohesive national service.

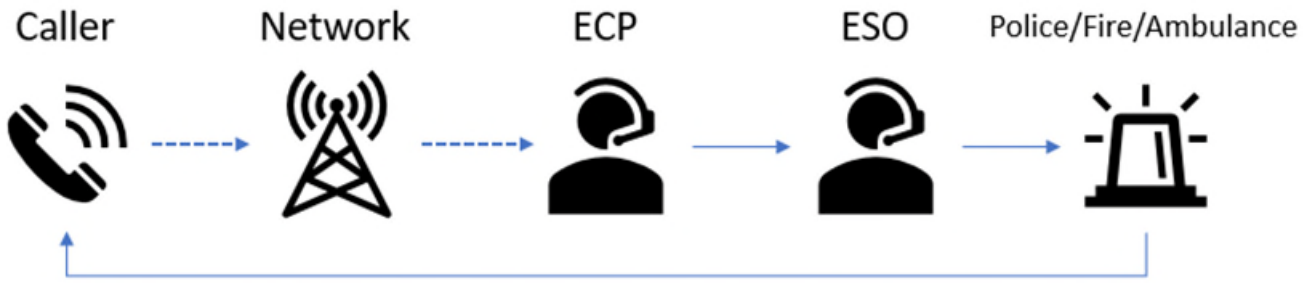
There is a range of legislative, regulatory, and contractual requirements for the different actors in this ecosystem, including requirements relating to network outages. These arrangements are intended to ensure Australians have access to emergency services as far as is practically possible at all times.

Existing arrangements

The Triple Zero Process

When a person calls Triple Zero:

- The call is transmitted by the caller's provider to the ECP
- The call is received by the ECP
- The caller is presented a Recorded Voice Announcement advising the caller that they have dialled Triple Zero and will be connected to an operator
- The ECP operator takes the call and asks 'Police, Fire or Ambulance?' and for location details from the caller
- The ECP connects the call to the relevant ESO in the state or territory from which the call is being made
- The ECP sends the ESO a range of information from a number of sources with assists to identify the caller's location and
- The ESO handles the call and provides appropriate emergency service support.



Roles and responsibilities

The Department

The Department is responsible for managing contractual arrangements with Telstra as the ECP.

The Department also chairs and provides support for an inter-jurisdictional committee, the Triple Zero Coordination Committee (TZCC), and participates in the National Emergency Communications Working Group (NECWG).

Emergency Call Person (ECP)

Triple Zero is a service provided by Telstra and its predecessor organisations under varying arrangements since 1961. It originally provided this service as part of its role as the national telephone operator then more recently, since 2012, through the Telstra Universal Service Obligation Performance Agreement contract with the Australian Government. The service is currently a voice only service, with Telstra operators answering all calls to Triple Zero (000 or 112). Telstra, as the ECP, has regulatory as well as contractual obligations to provide the Triple Zero Emergency Call Service.

Under section 147 of the *Telecommunications (Consumer Protection and Services Standards) Act 1999*[3], the ACMA imposes requirements on telecommunications carriers, carriage service providers (CSPs) and the ECP designed to ensure the ongoing effective provision of emergency call services.

The requirements imposed upon the ECP and the wider telecommunications industry in delivering Triple Zero are set out in the ECS Determination. The ECP is responsible for transferring calls to the Police, Fire or Ambulance as requested by the caller. Under the Determination, the Triple Zero operator is required to answer 85% of calls to the emergency service numbers within five seconds, and 95% of such calls within 10 seconds.

The contract sets out the ECP's obligations, which broadly echo those in the ECS Determination.

The contract does not require the ECP to provide oversight of the end to end delivery of the Triple Zero service or to act as a custodian or overseer of the ecosystem as a whole.

Concentrix, the current provider of the National Relay Service, is the nominated ECP for 106, a text based (via teletypewriter) emergency call service for people who are deaf or have a hearing or speech impairment.

Emergency Service Organisations (ESOs)

ESOs are the police, fire, or ambulance services in each state and territory in Australia. ESOs throughout Australia are responsible for supplying answer points to the ECP and engaging with callers making emergency calls to facilitate the dispatch of the appropriate emergency services to respond to life threatening or time critical situations.

These organisations include government agencies and contracted organisations, with a mixture of paid and volunteer staff. ESOs are responsible to their relevant state or territory government which establishes certain requirements such as call answer times. Each jurisdiction has its own legislation specifying how ESOs operate and are managed.

Carriers and Carriage Service Providers

Carriers and CSPs must carry emergency calls to Triple Zero as a priority, meaning these calls are carried ahead of other calls in the networks. This requirement is set out under the ECS Determination. The ECS Determination also specifies requirements for carriers and CSPs about notification, cooperation and welfare checks in the event of a significant network outage.

ACMA

The ACMA is the telecommunications industry regulator and is responsible for ensuring compliance with the ECS Determination.

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[3] See Federal Register of Legislation - Telecommunications (Consumer Protection and Service Standards) Act 1999

TZCC and NECWG

Triple Zero is supported through two separate inter-jurisdictional committees, the Triple Zero Coordination Committee and the National Emergency Communications Working Group.

TZCC is a forum to facilitate formulation of national policy direction for the Emergency Call Service and provides a forum for discussion about end to end delivery of Triple Zero and consideration of future technology changes. It includes representation from Commonwealth, state and territory governments, as well as industry and consumer groups.

NECWG is a body which promotes collaboration between ESOs and the ECP, and provides advice to TZCC and other stakeholders on operational matters. In addition to ESOs and the ECP, the Department, the ACMA and the National Emergency Management Agency (NEMA) participate in NECWG meetings.

These committees are intended as mechanisms for information sharing, decision making and ensuring Triple Zero is a cohesive national emergency call network that operates as a seamless end-to-end service.

The roles of these committees do not include acting as a custodian or providing oversight of the Triple Zero ecosystem as they are not well adapted to doing so.

Laws and regulations

The Emergency Call Service is established under the *Telecommunications Act 1997* [4]and the *Telecommunications (Consumer Protection and Service Standards) Act 1999.*

The legislation enables the ACMA to make a determination requiring carriers, CSPs and the ECP to deliver Triple Zero, and how they should do so.

The ECS Determination does not apply to ESOs, which are subject to various state-based obligations and requirements.

The Determination seeks to ensure:

- The highest levels of access, integrity and service continuity of the emergency call service are maintained
- That the networks and facilities it covers are able to successfully carry emergency calls to the emergency call service
- That a CSP, as far as practicable, carries emergency calls in a way that would give any end user of an emergency telephone service the experience of a single national emergency call system.

The ECS Determination includes provisions which require carriers and CSPs to cooperate with the ECP to enable access to the Emergency Call Service when there is a disruption to Triple Zero.

The Determination also includes provisions requiring CSPs to undertake or arrange to undertake welfare checks on end-users who have made unsuccessful calls to Triple Zero.

It does not designate any person or organisation as having overall responsibility for the operation of the Triple Zero system.

Codes, Standards and Guidelines

Communications Alliance (the peak telecommunications industry body) has developed codes and a standard, which are enforceable by the ACMA, that sets out operational rules for the telecommunications industry about the delivery of the Emergency Call Service. It has also created several unenforceable industry guidelines

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[4] See Federal Register of Legislation - Telecommunications Act 1997

designed to provide general guidance to industry participants about how best to deliver the Triple Zero service and communicate with each other about it.

Industry Code C536: Emergency Call Service Requirements[5]

This code includes rules specifying requirements to:

- Identify cyber-attacks and address non-genuine calls
- Cooperate with other carriers and CSPs to resolve complaints relating to an emergency call
- Correctly program Subscriber Identity Modules (SIM cards)
- Share network outage notifications made to the ECP with the ACMA and
- Nominate points of contact for ESOs and Communications Alliance

Industry Guideline G557: Location Information for Emergency Calls[6]

G557 provides guidance and specifications with regard to location information provided to the ECP and ESOs during calls made to Triple Zero.

Industry Guideline G663: Telecommunications – Emergency Communications Protocol[7]

G663 provides guidance to establish a common model for communication during a major service disruption (MSD) resulting a large-scale loss of connectivity from any point in a communications network.

It includes a severity matrix to provide guidance as to the appropriateness of specific communication methods depending on the circumstances. For example, the establishing of a 'partner bridge' stakeholder forum during an MSD to share information, discuss the impact, coordinate public messaging and agree to action items and responsibilities, is recommended as a response to a "critical event".

No partner bridge was established in this instance.

Industry Guideline G644: Emergency Call Service Protections Requirements

Sets out communication principles and media messaging for severe disruptions to the emergency call service.

This Guideline was not used in this instance. This Guideline is not publicly available.

Australian Standard AS/CA S042.1: Requirements for connection to an air interface of Telecommunications Network[8]

This standard, drafted by Communications Alliance, specifies the requirements for customer equipment (handsets), which are intended to be used to connect to and communicate via mobile networks or satellite services. It includes technical guidance for testing these handsets for various scenarios including accessing the emergency call service. Carriers use this guidance in conducting the testing that they do. There is currently no requirement for universal or cross-industry testing.

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[5] See C536:2020 (commsalliance.com.au)
[6] See Communications Alliance - G557:2023 Location Information for Emergency Calls (commsalliance.com.au)
[7] See G663_2022 (commsalliance.com.au)
[8] See Communications Alliance - AS/CA S042.1:2022 Requirements for connection to an air interface of a Telecommunications Network - Part 1: General (commsalliance.com.au)

3GPP[9]

The 3rd Generation Partnership Project (3GPP) develops technical specifications that provide an international standard for mobile systems. These specifications are not mandatory, but facilitate interoperability between mobile handsets and mobile networks across jurisdictions. Specifications include enabling SIMless calls to emergency call numbers, handsets recognising standard emergency call numbers, and networks prioritising emergency calls. Advice to the Review is that handsets sold to consumers in Australia comply with 3GPP requirements.

Access to Triple Zero during a network outage

During any network outage, or other fault, fixed line customers of the network experiencing the outage or whose line is experiencing a fault are unable to make calls, including calls to Triple Zero. However, a benefit of mobile services is that affected mobile network customers can generally retain access to Triple Zero through a functionality known as “emergency camp on” when their network is not functioning or when they are in an area not serviced by their network but serviced by others.

This enables a mobile device to connect to another available network for the purposes of calling Triple Zero if the device is unable to detect the user’s ‘home’ network (for example because of an outage).
This functionality is enabled through an internationally agreed operating protocol for mobile devices (set by 3GPP, usually called emergency camp on but technically known as Limited Service State).

In a mobile telephone network, when a mobile device is turned on it goes through a selection process to find an appropriate cell to connect to (camp on). This is governed by a network profile in the SIM and information transferred to the device from the mobile network.

Mobile devices without a SIM are also programmed to enable calls to Triple Zero through any available network.

Section 10 of the ECS Determination refers to and requires camp on in Australia. It recognises that in an emergency, any network may be required to be used to give an end user access to Triple Zero.

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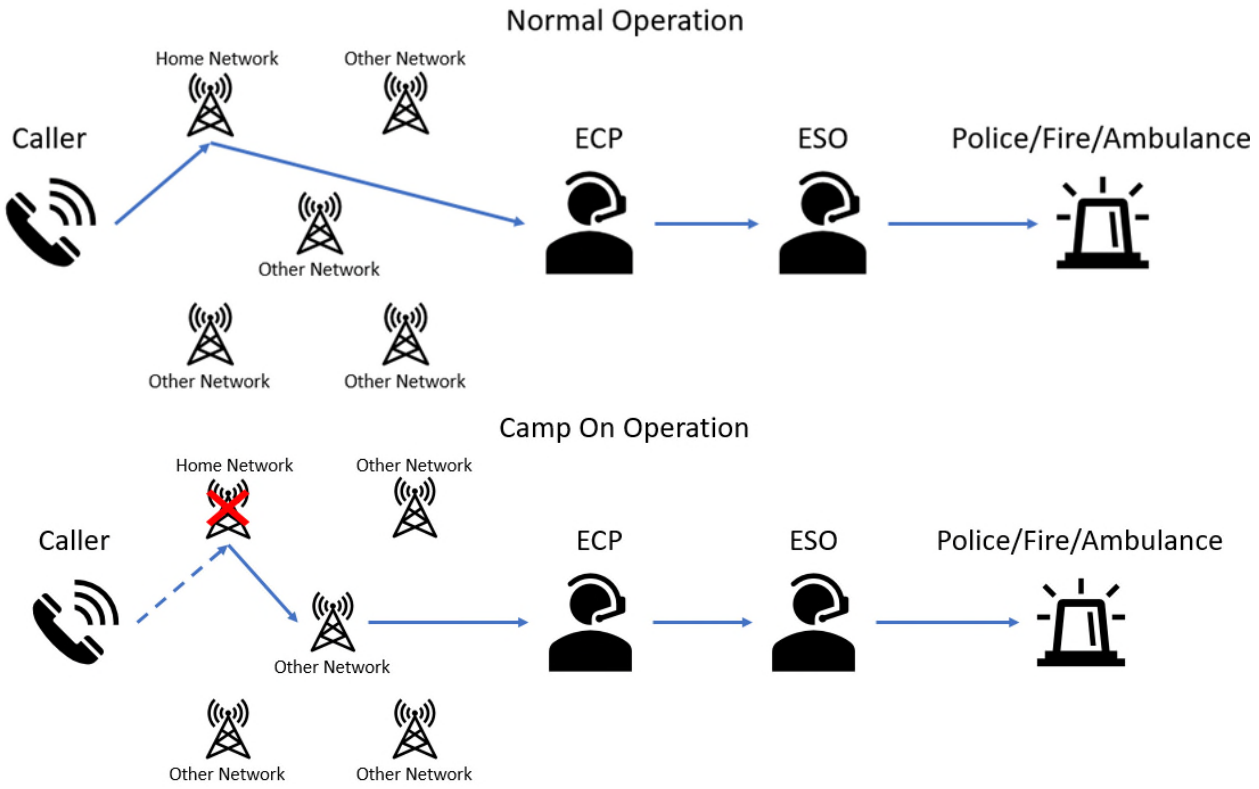
[9] 3GPP is the 3rd Generation Partnership Project, an umbrella term for a number of standards organizations which develop protocols for mobile telecommunications



How existing arrangements fared on 8 November

The Optus Network

As noted above, during a network outage, fixed line customers of the network are unable to make calls, including calls to Triple Zero. This means an even greater reliance on mobile calls.

Unfortunately, during this outage, some Optus mobile calls also could not connect to the ECP. Optus has reported that some calls were able to connect to Triple Zero via emergency camp on, while others could not. Despite established emergency camp on arrangements, some calls attempted by users of the Optus mobile network did not camp on to alternative networks. It appears that some Optus mobile base stations were still operational (emitting radio signals), despite losing connection to the Optus core network. Some handsets continued to connect to these 'live' stations rather than seeking an alternative network, but were then unable to progress to Triple Zero because of the failure in the Optus core network.

In situations where an operator's core network fails, some mobile operators enact a shutdown of their towers, effectively turning the base stations off, so that handsets seek out live towers on alternative networks if attempting a Triple Zero call. This practice, known as wilting, has been operational in some Australian networks since at least 2014.

At a meeting on 22 January, Optus provided information to the Review that the Optus network automatically wilted its 4G and 5G towers, but some elements of its 3G network and towers remained live, though unable to carry calls because of the failure of the core network. Optus suggests that it was the presence of these live towers that resulted in some Optus mobiles not seeking out alternative networks to carry calls to Triple Zero, hence customers in range of those towers did not have their calls passed through to Triple Zero.

Expert advice to the Review supports this conclusion. It is apparent that a combination of tower malfunction, core failure and the way mobile devices operate caused some calls to fail to access Triple Zero.

This analysis is based on information provided by Optus and other industry participants, and on subsequent discussions with submitters. However, the investigation being conducted by the ACMA is expected to look into the manner of the failure of some calls to connect to Triple Zero in more technical detail.

It is important to note that, if the above analysis is confirmed, future instances of calls failing to connect to Triple Zero will not occur in a similar manner when 3G networks are shut down over the coming year. However, submissions suggest that some failures, though extremely unlikely, may still be possible within 4G and 5G networks (see Recommendation 3).

Visibility of the issue

Optus (as the affected carrier) and Telstra (as a carrier and the ECP) held information about what was occurring on the day, yet neither had full visibility of the scale and nature of the outage. The experience of some other participants in the system, such as some ESOs, also indicated to them that something was wrong.

No single body could see the whole picture. This significantly hampered the dissemination of accurate and timely advice to the community.

It was apparent to the ECP that many Triple Zero calls were continuing to connect to the ECP through the emergency camp on process. Telstra/the ECP concluded that a spike in camping on was a result of the Optus outage and that Optus customers calling Triple Zero were camping on to alternative networks. Optus was confident that the wilting capability in its network would result in camping on to alternative networks. Given these indicators, Optus issued public statements that mobile customers would still be able to contact Triple Zero in an emergency. There was some anecdotal information and resulting media coverage that cast some doubt on this advice, leading to doubts about some public messaging and to community concern. Optus was the only party with direct knowledge of its network but it was unable to clarify this issue for customers or other stakeholders on the day because the outage compromised its own ability to communicate with its network. It wasn't until 12.55pm that Optus made a public statement that some mobile calls were unable to connect to Triple Zero. By this time some services had already begun being restored.

Despite existing regulatory arrangements, industry codes and guidelines, and the best efforts of many participants in the Triple Zero ecosystem and others to communicate and share information during the outage, there were clear deficiencies and inefficiencies in the processes followed.

The ECP

The ECP continued to operate 'as normal', insofar as calls that reached it were received and referred onwards appropriately.

Internal Telstra network monitoring identified that there was an issue with calls to or from the Optus network generally (that is to say, not specifically Triple Zero calls) in the early hours of 8 November. This occurred well before Optus advised the ECP of the outage or acknowledged the outage publicly. While the ECP was made aware that there were issues with the carriage of calls to and from the Optus network (by Telstra's Incident Management Operations Team), as it does not have direct visibility of other networks, it did not know of the extent of the problem. Likewise, it could not be aware of unsuccessful calls to Triple Zero if those calls failed to leave the Optus network, other than through caller anecdote.

This lack of visibility resulted in difficulties providing accurate advice to the public and other key stakeholders, including ESOs, as the day progressed. Advice indicating that Triple Zero was operational despite many Optus mobile customers failing to connect to the ECP was given because it was known that Optus calls were camping on to other networks in unusually high volumes, and calls not camping on were not visible to the ECP.

Despite the centrality of the ECP to the ecosystem, it was unable to establish an accurate picture of what was occurring for Optus mobile customers, and to communicate that to others such as Optus's wholesale customers and their customers, ESOs or government. Nor was it obliged to do so. This state of affairs is reflected in the Recommendations.

The ECP does maintain a protocol referred to as the Triple Zero Disruption Protocol (TZDP). The TZDP is a protocol agreed between carriers, ESOs and the ECP. It sets out, among other things, the capacity for any of the participants to stand up a partner bridge, or teleconference, to discuss major issues, including outages. The ECP did not stand up the partner bridge on the day as from its perspective Triple Zero was operating as

expected, with calls coming in and being put through to ESOs. Optus had the capacity to initiate the bridge (as a party to the TZDP) but this did not occur. Enacting the partner bridge mechanism would have been useful in keeping all stakeholders across the ecosystem informed of developments.

ESOs

ESOs were not provided with formal advice about the outage or its implications for Triple Zero.

Like the ECP, ESOs have no visibility of the functioning of telecommunications networks.

Several ESOs strongly emphasised that real time information sharing about network functioning and in particular outages would be immensely useful to their service delivery, and suggested making information sharing, currently referred to in unenforceable guidelines, mandatory. Several mentioned that at the very least a partner bridge would have been very useful to them on the day. Their submissions are reflected in the Recommendations.

A number of ESOs currently share emergency notifications with one another through their Computer Aided Despatch (CAD) systems via inter agency CAD electronic messaging system (ICEMS). ICEMS passes real time messages about incidents and replaces the need for the impacted ESO to take a voice call. ICEMS does not however provide ESOs with carrier information and is not utilised nationally.

Areas for improvement and change

The responses received to the Review from a wide range of industry, community and government representatives identified a clear need to improve several aspects of the existing Triple Zero ecosystem. The problems that the Review has identified are cultural, structural and technical.

Managing the ecosystem

A key message of submissions received by this Review is the need to reconsider how the Triple Zero ecosystem as a whole is managed.

The ECP plays a central role, but it does not manage or oversee the system. Its contract does not require it to.

Evidence provided by several participants in the delivery of Triple Zero strongly indicated that the absence of an end-to-end authority, a single person or organisation with visibility of and custody of, if not outright control over the ecosystem, hindered the ability of all parties to respond appropriately.

The different roles and functions of the participants in the delivery of Triple Zero resulted in each having its own siloed view of the system, and each ‘staying in its lane’ on the day.

For example, the ECP reported that the functioning of Triple Zero was as it should be, yet some Optus customers could not contact Triple Zero. The ECP had concerns about the operation of the emergency camp on arrangements but could not verify these concerns because of the lack of visibility of the Optus network. This contributed to the difficulty in obtaining reliable information about what was occurring. ESOs were particularly hampered.

The vesting of overarching responsibility for, and visibility of, the end to end functioning of the Triple Zero service in one person or organisation would have significantly improved information flow and recovery efforts on the day.

Such a body should be established as a new agency, or the role could be performed by an industry member or an existing Government agency.

Network and handset testing

Optus and Telstra have provided responses offering differing technical views as to what and how the outage may have best been analysed, managed and resolved.

Every carrier has a different (unique) network architecture and as such, differing views on the potential technical fix for this circumstance.

Regardless of the technical reasons for the outage, it is clear that more testing of network interoperability is needed to ensure problems are identified and anticipated.

The complexity of the carriers' mobile networks and the necessity of interoperability to deliver Triple Zero calls demands a more thorough approach to testing than is currently in place. The carriers do not test with and/or across each other's networks. While testing the camp on function on their own networks, even if covering all scenarios, the testing does not guarantee (as far as practicable) that calls will be picked up when a competitor's network is unavailable.

Current testing regimes do not cover all devices sold by all carriers, and there is no system for addressing the capabilities of the devices of customers who bring their own. The countless variations in handsets, handset and SIM settings, and the alternative configurations between nodes within each of the networks, present a significant risk to the certain operation of the camp on functionality in all (or as many as might reasonably be anticipated) circumstances. This needs to be addressed.

The establishment of cross-carrier end-to-end network and device testing including under the wide range of known scenarios would provide information and insight into potential issues before major outages occur.

Such testing may have gone someway to anticipating the failure of some calls to connect to Triple Zero on the day of the outage.

Real Time data sharing among Telcos, ECP and ESOs

ESOs and the ECP refer to a lack of real time data or other information about the state of carrier networks hampering their ability to respond or provide accurate information to constituents.

Each of the carriers maintains a Network Operation Centre which provides them with real time advice about their networks. Separately, the ECP has a performance dashboard which details information about calls transiting across the ECP platform, including wait times, call queues and specific location information about incidents and ECP connectivity.

Shared access to these data sets would be extremely beneficial to ESOs in particular, as well as the ECP in understanding impacts on the delivery of Triple Zero, enabling appropriate responses to be developed.

Communications Alliance maintains Industry Guideline G665:2022 – Telecommunications – Facilities Information Sharing[10], which could be expanded to include data about network and ECP performance in real time.

The ECP has noted that following the outage it will update its performance dashboard to display (to it) call volumes by carrier to identify any abnormal call volumes.

Industry should promptly develop and implement a real time data sharing system enabling all participants to see network outages and real and potential Triple Zero difficulties.

Failing that, mandatory data sharing requirements should be introduced by means of an enforceable code or otherwise. Such a system would need to be adequately protected by the application of industry best practice cyber security standards.

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[10] See G665_2022 (commsalliance.com.au)

Carriers' obligations

Carriers' obligations should be modified. Currently there is no requirement for carriers to:

- Prioritise restoring access to Triple Zero when restoring network function during and after an outage
- Provide information about an outage's impact on Triple Zero to other actors in the Triple Zero ecosystem and the government or public.

While the TZDP recommends procedures to facilitate notification of disruption to Triple Zero, there is no mandatory code which obliges carriers to notify the community, government, or other telecommunications entities of such a disruption, and there should be.

Recommendations

1. Mandatory requirements should be put in place, by augmenting existing requirements or otherwise, to:

- More clearly and explicitly articulate precisely what is expected of network operators in regard to ensuring calls are delivered to Triple Zero
- Include specific obligations that network operators wilt towers in the event of loss of connectivity to a core network, ensuring calls to Triple Zero can be carried by other networks.

2. Establish a Triple Zero custodian, with oversight of and overarching responsibility for the efficient functioning of the Triple Zero ecosystem, including monitoring the end-to-end performance of the ecosystem.

   There are a number of ways this could be achieved, including by establishing a new body or enhancing the role of an existing body. It would not be a regulatory function: where matters were identified for change, existing bodies would be responsible for implementation.

3. To ensure (to the extent possible) continuous access to Triple Zero, carriers must conduct 6-monthly end-to-end testing of all aspects of the Triple Zero ecosystem within and across networks. The end to end detection testing should include:

- Network functionality and capability during outages of various types
- Behaviour of all known devices in different circumstances
- Interoperability of all parts of the ecosystem (from originating carrier, to ECP, to ESO answering point) during outages.

   Any identified deficiencies must be reported to the ACMA and be accompanied by a remediation plan with timetable.

   This requirement should be mandated in a standard or determination.

4. If this testing does not include devices supplied by the customer (i.e. 'Bring your own device') then information should be provided to those customers warning that those devices may not have been tested in emergency scenarios.
5. Require carriers, through a standard or determination, to share real time network information detailing outages with relevant emergency services organisations and other appropriate entities, including the body referred to in Recommendation 2.
6. Require providers, through a standard or determination, to report to the ACMA and the Department, within a mandated timeframe after a major outage, detailing its causes, steps taken to resolve it, the impact on Triple Zero, and a clear and detailed plan, with timeline, to address issues identified and avoid similar outages in the future.
7. Combine and expand existing disruption protocol instruments to cover all matters relevant to outages in any element of the Triple Zero ecosystem.

   There are currently multiple obligations related to actions taken during and after network disruptions. Combining these obligations in one document and ensuring they cover the system from end to end would greatly improve understanding and clarity of responsibility.

8. The Department should review the contract under which Triple Zero is delivered, with a specific focus on the central role of the ECP within the ecosystem.

   The review should consider, in light of the recommendations of this Review relating to the Triple Zero ecosystem, including Recommendation 2, governance structures, and separating financial matters from other ECP obligations.

TOR 2 – Role of government in managing and responding to a national service outage

Existing arrangements

Carriers are responsible for the functioning of their communications networks and responding to and resolving service disruptions. However, the Government has an important role to play in assisting with coordination and management of responses to emergencies and crises.

Australian Government Crisis Management Framework

The AGCMF "outlines the Australian Government's approach to preparing for, responding to, and recovering from crises".[11] It is currently being reviewed by the Department of Prime Minister and Cabinet. This will involve consideration of national crisis management arrangements, including crises like the Optus outage.

National Coordination Mechanism

The NCM was created as part of the response to the COVID-19 pandemic. The NCM brings together agencies of the Australian Government, state and territory governments and industry and private sector stakeholders. The NCM mechanism is embedded as a permanent response tool in the AGCMF, ensuring the Government can bring together the relevant representatives of both government and non-government organisations to coordinate, communicate and collaborate during responses to crises. NEMA (see below) is responsible for enacting the NCM.

National Emergency Management Agency

NEMA is Australia's national disaster management organisation and supports whole-of-government crisis responses as the Secretariat for the Australian Government and Crisis Recovery Committee, the peak senior officials' crisis coordination committee, and the NCM. During incidents like the Optus outage, NEMA supports whole-of-government and whole-of-nation coordination through the NCM and the National Situation Room.

Trusted Information Sharing Network

The Trusted Information Sharing Network (TISN) is a mechanism for government and industry to improve the security and resilience of critical infrastructure, administered by the Department of Home Affairs.
TISN members meet quarterly working together to identify and manage risks, address security gaps and implement mitigation strategies, inform policy and programs to support critical infrastructure resilience, and achieve the objectives of the Critical Infrastructure Resilience Strategy[12].

TISN has several sector groups for different critical infrastructure industries, including the Communications Sector Group. The Department performs secretariat duties for this group. The group encompasses telecommunications, broadcasting, postal services and related industries. The membership is broad and consists of over 130 representatives, including telecommunications, broadcasting and postal service representatives. The Communications Sector Group was set up by Home Affairs under the TISN and is industry led.

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[11] See Australian Government Crisis Management Framework (pmc.gov.au)

[12] See Critical Infrastructure Resilience Strategy (cisc.gov.au)

The Communications Sector Group is not well adapted to supporting incident responses during emergencies or network outages, and emergency management and planning is not detailed in the group's terms of reference. TISN includes an online engagement platform hosted on Microsoft Teams which facilitates engagement between members as well as coordination across sectors.

Protocol for Notification of Major Service Disruptions

The Protocol for Notification of Major Service Disruptions, September 2022 (the Protocol) sets out how the Department will liaise between industry and the Minister for Communications in the event of a major disruption to services in the communications sector. The Protocol is not mandatory and there is no sanction for non-compliance.

Under the Protocol, an MSD is defined as any disruption that:

- Is unexpected and not a scheduled service outage
- Cannot be resolved within a very short period of time
- Impacts a significant number of businesses and/or customers
- Impacts large geographic areas or regions
- Impacts key government facilities, infrastructure and essential services
- Impacts national security, economic security or public health and safety
- Is likely to generate media coverage and/or political sensitivities.

When there is an MSD:

- The telecommunications provider should notify the Department and the NEMA by email. The Protocol sets out what information should be included in the notification
- The Department should receive updates "as substantive new information becomes available", including when the MSD has been resolved and its cause, if known
- Telecommunications providers should maintain points of contact for issuing updates and responding to information requests. The Department can ask the telecommunications provider for information about the MSD
- The Department should advise the Minister for Communications and relevant government stakeholders, including, where necessary, state and territory agencies, of the MSD.

Comparison with other industries and jurisdictions

The energy sector

When dealing with an energy supply emergency, the Government's policy is to intervene only as a last resort, after the industry has exhausted all other avenues to deal with the problem.[13]

Its approach is to support three emergency management forums designed to ensure the Commonwealth and state and territory governments and industry can work together to develop emergency plans and procedures:

- The National Electricity Market Emergency Management Forum
- The National Gas Emergency Response Advisory Committee and

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[13] See Energy supply emergency management across Australia - DCCEEW

- The National Oil Supplies Emergency Committee.[14]

The Department of Climate Change, Energy, the Environment and Water also provides secretariat support for the Electricity Sector Group, which is part of the TISN In Group meetings, critical energy infrastructure owners and operators can share information on security issues and improving infrastructure resilience.[15]

Canada: The Rogers Communications outage

On 8 July 2022, Canadian telecommunications company, Rogers Communications, suffered an outage that affected more than 12 million users. It was estimated that around 25% of Canadian users lost their connection to the internet during the outage.

In February 2023, in response to the Rogers outage, the Canadian Radio-television and Telecommunications Commission (CRTC) issued an interim directive requiring carriers to:

- Notify it within two hours when a carrier becomes aware of a 'major service outage', which is defined as any outage affecting (i) more than 100,000 subscribers or a material portion of the carrier's subscribers for more than one hour, (ii) subscribers that are in a geographic area served only by the affected carrier, (iii) critical infrastructure, (iv) major transport facilities, or (v) a 9-1-1 network.
- Within 14 days of a major outage, provide a comprehensive report detailing its causes, steps taken to resolve it, the effect upon emergency and accessibility services and a plan to avoid similar outages in the future.[16]

The development of Recommendation 6 (in the discussion under Term of Reference 1) was prompted in part by this response.

In March 2023, 13 Canadian telecommunications companies entered into a Memorandum of Understanding on Telecommunications Reliability[17]to establish protocols for temporary emergency roaming, provision of mutual assistance and communication (to the government and the public) in the event of a "Critical Network Failure".

Emergency mobile roaming is discussed in more detail under Term of Reference 5. The development of Recommendation 15 (in the discussion under Term of Reference 5) was prompted in part by this response.

How existing arrangements fared

There were communication, collaboration and information sharing deficiencies throughout the day, indicating that existing protocols, guidelines and other arrangements did not operate effectively to provide a clear and coordinated response across key stakeholders.

The Protocol for Notification of Major Service Disruptions was not adhered to during the event.

The AGCMF was not engaged. In the Optus outage scenario, it may have been beneficial for the AGCMF to be engaged early to aid understanding of the potential consequences of the incident.

The NCM process was activated and two NCM meetings were held during the afternoon of 8 November 2023. The meetings included representatives from Australian Government (including members of the Australian Government Crisis and Recovery Committee) and state and territory First Ministers Departments and emergency response agencies.

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[14] See Energy emergency management forums - DCCEEW

[15] See Energy infrastructure resilience - DCCEEW

[16] See Telecom Notice of Consultation CRTC 2023-39

[17] See Memorandum of Understanding on Telecommunications Reliability (canada.ca)

Though not occurring until the afternoon, these meetings operated effectively to allow Government and industry to share information without duplicating or further confusing lines of communication.

Areas for improvement and change

Government-led coordination, communication and collaboration

While AGCMF and NCM have proven to be effective frameworks and tools for managing emergencies and crises, the Government should use the lessons of the Optus outage to further develop the effectiveness of these arrangements in the event of serious telecommunications outages.

A major review of the AGCMF is currently being finalised. The AGCMF review, and work that flows from the findings of that review, will provide an opportunity to improve these processes.

The Optus outage has also highlighted the need for government agencies (and indeed carriers) to improve their own telecommunications redundancy arrangements to ensure connectivity and coordination during outages.

The Review notes that, taking the energy sector as an example, there is scope for the Government to support emergency management forums where all stakeholders can collaborate on emergency plans and procedures. Use of the TISN, or something similar, should be considered if forums are established.

Protocol for Notification of Major Service Disruptions

Several responses to the Department suggested the existing protocol should be replaced, reviewed and/or uplifted into direct regulation. Views included:

- While reporting between Optus and the Minister for Communications, the Hon Michelle Rowland MP, “appears to have been sufficient”, there could be “greater clarity” in how a telecommunications company shares information with Commonwealth, state and territory government agencies during an outage and that reporting should be mandatory and clearly defined when the outage affects the ability to contact Triple Zero.
- The effectiveness of the Protocol in mitigating the impacts of an outage and assisting recovery could be reviewed.
- Consideration should be given to the creation of “a single source of information” that is notified of an outage, particularly as a way of streamlining the flow of information between the Government and industry and of reducing the number of government agencies contacting impacted networks.

Recommendations

9. The Protocol for Notification of Major Service Disruptions (the Protocol), should be improved and augmented with clear and detailed requirements for Government communication and collaboration during telecommunications outages through a central coordination point in Government.

   This should cover communication and collaboration with carriers, relevant Ministers, Commonwealth, state and territory government agencies, TIO, the Australian Consumer and Competition Commission (ACCC), ACMA, Emergency Service Organisations (ESOs) and other relevant parties.

   The Protocol should also be closely aligned with the Australian Government Crisis Management Framework (AGCMF) and the National Coordination Mechanism (NCM).

TOR 3 – The adequacy of requirements for customer communication in national service outages

Description of existing arrangements

Emergency Communications Protocol – Industry Guideline

The key instrument that details how telecommunications providers should communicate with stakeholders in these circumstances is the Communications Alliance Emergency Communications Protocol – Industry Guideline G663:2022[18].

The Guideline sets out the information that is to be provided during an MSD. Key stakeholders are divided into seven streams: consumers, the ECP, ESOs, Government, regulatory, telecommunications dependencies (e.g. utilities and data centre providers) and telecommunications suppliers, and industry bodies.

When a carrier or CSP becomes aware of an MSD, it determines the most suitable mechanism for relaying information, based on a severity matrix included in the Guideline.

Importantly, the Guideline states that above all, during an MSD a provider's priority lies with restoring and maintaining communications capabilities of its customers to the best of its abilities.

As to communication with consumers, the Guideline notes that, where appropriate, the public will be informed how to obtain further information on the impacts of an MSD. This may be via a variety of radio networks, emergency warnings from broadcasters or other network operators if roaming agreements are in place, and via public media announcements, stakeholder websites and social media channels.

The parties are expected to work together to ensure information communicated to the public is clear and promotes community confidence in the telecommunications sector.

The Guideline is limited and operates entirely at the providers' discretion.

It would benefit from a more explicit focus on the information needs of the customers of the affected network.

It would not appear that Optus followed any of the guidance in this document.

Comparison with other industries and jurisdictions

Energy

The energy sector has no specific requirements governing how outages are communicated. Some energy providers include information on their websites to assist their customers to prepare in case of an outage, or report outages and some also include outage maps that show the affected area and restoration time. Usually, a customer will receive a text message if there is an outage in their area with the estimated restorage time.

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[18] Communications Alliance - G663:2022 Telecommunications – Emergency Communications Protocol (commsalliance.com.au)

Canada

As described above, following the Rogers outage in July 2022, an MOU was agreed by 13 mobile operators. Under this enforceable MOU, parties must ensure they provide the public and government authorities with key network information, which is set out through their action plan. The approach to communications during an outage is based on the principles of providing timely, relevant and understandable information in a clear and accessible manner.

How existing arrangements fared

Existing guidance largely leaves it to individual providers to determine the level and methods of engagement and the types of information that they communicate to customers and the public: they determine what is adequate and appropriate to provide and to whom.

An added complexity is the number of different references as to what constitutes a major outage. This situation applies in regard to providers' communications with customers, but also with each other in matters that affect calls to Triple Zero.

Without a clear and shared understanding of when action should be taken, the existing guidance is not as useful as it could and should be.

Communication with customers on the day

Optus issued its first media statement at 6:33am, approximately 2.5 hours after the outage commenced, which was followed by announcements across its social media channels. At 8:16am, Optus issued a further media update and associated social media post. A timeline of Optus's public statements on 8 November is at **Attachment B**.

Optus has noted that as its customers were unable to access its services, it considered that the quickest and most effective way to communicate with its customers was through the media. In parallel, Optus was also in contact with its business customers.

Optus also posted an announcement on its website and social media channels (once back online at 12.55pm) in relation to the outage and provided information at its retail stores from 2.00pm.

Throughout the course of the day, Optus' Chief Executive Officer conducted 11 media interviews to provide information to the public and to provide assurance to its customers that it was doing everything it could to get the network up and running. Optus' Chief Executive Officer was criticised for not holding a media conference.

Optus commenced an email campaign on 9 November, formally apologising to customers for the outage and offering compensation in respect of the services they receive.

Telecommunications provider communications

Optus has stated that it considers its communications with customers and the public about the outage were adequate and appropriate. However, this view is not shared by others including the Review.

The Telecommunications providers that provided submissions to this Review advised that they consider communications with customers to be part of their telecommunications service offering, and a means by which they offer a point of difference in the market.

Optus, NBN Co, Telstra, TPG and Vocus indicated to the Review that they have crisis and incident management plans in place that include procedures on how they communicate with customers during all forms of service disruptions. In some instances, providers set up crisis management units during major disruptions. Optus, Telstra and Vocus have also noted they routinely test these systems through training

exercises and by regularly updating and reviewing their communication materials, messaging and stakeholder contact lists.

Consumer view

Customers' dissatisfaction with Optus' communications and messaging was widely reported in the media. The Review has received formal and informal submissions from personal and business customers expressing their dissatisfaction with Optus' handling of the outage. A large number of letters and emails were sent to the Minister for Communications by members of the public, universally expressing dissatisfaction with communications from Optus.

Consumer advocates assert the need for clear communication guidelines, or indeed enforceable rules, for telecommunications providers to follow in response to unplanned outages. They consider Optus' communications with its customers during the outage were not adequate, with the lack of timely and clear information causing considerable distress. They have also noted that when an outage like this occurs, it has a greater impact on the more vulnerable members of our communities who already face challenges in accessing communications services, including those living with disabilities or on lower incomes, as well as those living in regional, rural or remote areas.

Areas for improvement and change

Communication during the Optus outage was inadequate.

There are currently no set requirements for the way in which service providers communicate with their customers. Each provider has its own approach. Competitive pressures alone do not appear to be improving consumer communications and consumer outcomes through the course of recent crises.

The combination of the delays in advising customers, the lack of detailed answers and explanations as to the cause and impact of the outage across the day and the absence of timeframes regarding its rectification, call into question the adequacy of the current voluntary communication guidance.

In response, mandatory communication requirements should be established requiring providers to take specified steps during major outages.

Recommendations

10. The ACMA should develop a standard or determination requiring carriers to communicate specific information to customers during and about outages. The Communications Alliance Emergency Communications Protocol – Industry Guideline G663:202219 or one or more of the carriers' existing internal communications protocols could be used as a base but there needs to be an explicit focus on communications between the affected network provider and its customers as well as other stakeholders.
11. The Department should develop further and promote the educational initiatives developed in 2020-2022 to assist the public, businesses and other organisations to prepare for and recover from outages as a result of natural disasters. These materials should be reviewed and enhanced to apply to a broader range of scenarios including major network outages. The Department should promote these materials to the community.

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[19] See G663_2022 (commsalliance.com.au)

TOR 4 – The adequacy of complaint and compensation processes

Description of existing arrangements

Internal complaints handling

There are rules that telecommunication providers must follow when managing consumer complaints. These rules are set out in the Telecommunications (Consumer Complaints Handling) Industry Standard 2018[20] (the Standard).

The rules specify that a provider must:

- Try to fix any complaint when it is first raised by a consumer
- Acknowledge the complaint within set timeframes
- Fix urgent complaints within two working days
- Have a written complaint handling process
- Explain how problems will be fixed within 15 working days
- Take all agreed actions within the following 10 working days
- Keep a record of all complaints
- Monitor complaints and identify emerging issues.

The Standard requires a telecommunication provider's complaints handling process to be set up in a way that is easy for a consumer to use, meets the mandated timeframes to respond and resolve complaints, and makes the process transparent for consumers.

Telecommunication providers with more than 30,000 services in operation must also abide by the Telecommunications (Consumer Complaints) Record-Keeping Rules 2018[21], which require certain complaints records to be kept and reported quarterly to the ACMA.

External complaints handling

If a consumer is unable to resolve their complaint with their telecommunications provider they can raise it with the TIO. The TIO is a free and independent industry-funded dispute resolution service for consumers, occupiers and owners of property, small businesses and not-for-profits who have a complaint about their telephone or internet service provider.

The TIO Scheme is established under the *Telecommunications (Consumer Protection and Service Standards) Act 1999*. The TIO's Terms of Reference set out the types of complaints it handles and the way in which it handles them. The TIO assesses what is fair and reasonable in the circumstances having regard to the law, industry codes, guidelines and good practice. The TIO has the authority to make decisions that are binding on its members. Relevant telecommunication service providers are required by law to be a member of the TIO scheme and membership fees fund the dispute resolution scheme operated by the TIO.

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[20] See Federal Register of Legislation - Telecommunications (Consumer Complaints Handling) Industry Standard 2018
[21] See Federal Register of Legislation - Telecommunications (Consumer Complaints) Record-Keeping Rules 2018

Compensation

The TIO can also assist consumers to obtain compensation from their service provider in certain circumstances, for both financial and non-financial loss.

These circumstances include:

- Lost business profit due to connection delays or network faults
- Costs of having to pay for alternative services when a carrier or CSP does not supply agreed services
- Where an unusual amount of physical inconvenience, time taken to resolve a situation, or interference with an individual's peace of mind has occurred because of a carrier or CSP's action or inaction.

The TIO does not deal with claims for compensation:

- For the costs of making a complaint to the TIO
- For loss of business reputation
- Made to penalise a carrier or CSP.

The TIO will assess each compensation claim carefully before making a decision, taking into consideration what is fair and reasonable and what steps were taken by a customer to protect their interests and minimise any losses. Any amount of compensation awarded will be proportionate to the extent of the harm suffered.

For a financial loss, the TIO can direct a provider to pay up to $100,000 in compensation. A consumer will be required to provide the TIO with supporting evidence for a financial loss claim.

For non-financial loss, the TIO can award compensation for a maximum of $100,000 for complaints in relation to privacy rights, or a maximum of $1,500 for any other complaint. Most awards of compensation for non-financial loss are modest.

If the TIO estimates the value of a claim is likely to exceed $100,000, it may decide not to handle a complaint because a court or tribunal would be a more appropriate forum for that claim.

Customers may be eligible for a remedy under their contract or the Australian Consumer Law for an outage in certain circumstances. This may not be a remedy that is practically accessible to many. Mandatory penalties also apply in relation to certain outages affecting fixed phone services through the CSG (see discussion below). The TIO considers all relevant law and other factors in determining what is fair and reasonable. While customers may be able to take their complaint to a relevant tribunal or court, the TIO is likely to be the best course at first instance, certainly for the vast majority of individual citizens, and is therefore the focus of this aspect of the Report.

Comparison with other industries and jurisdictions

The energy sector has a complaints handling regulatory model similar to the telecommunications sector. If a customer is unable to resolve their complaint with their service provider they can take it to their state or territory ombudsman.

The energy sector has a Guaranteed Service Level requiring service providers to meet certain thresholds and if they are not met, automatic payments are made to the customer by way of a credit on their next bill. These payments are an acknowledgement of the inconvenience a customer experiences when their service provider does not meet the Guaranteed Service Level. Payments are determined on a state by state basis and separately for electricity and gas, although not all gas providers are a part of the scheme. Automatic payment systems are attractive because of their relatively simple administration and ease of access for consumers.

Unlike the TIO, energy ombudsmen cannot award compensation.

Designated complaints function

The designated complaints function (Competition and Consumer Amendment (Fair Go for Consumers and Small Business) Bill 2024)[22]was one of the Government's election commitments and has been subject to consultation by Treasury. Similar schemes (sometimes called super complaints schemes) also operate in the United Kingdom and Canada.

The proposed legislation would see approved consumer and business advocacy groups able to make designated complaints to the ACCC for assessment and response. These complaints would need to meet criteria including relation to a significant or systemic market issue impacting consumers or small businesses. They would also need to relate to breaches, or the ACCC's powers and functions, under the *Competition and Consumer Act 2010*[23].

Complaints of this type avoid the need for each consumer to make their own complaint and establish their own detriment in relation to an event affecting many.

How existing arrangements fared

The TIO noted in its submission to the Optus Senate Inquiry that when a telecommunications event affects consumers, it aims to respond quickly by communicating with the relevant member experiencing the outage and the public, as well as preparing its complaint handlers to assist consumers.

The information the TIO receives from its members and other stakeholders enables it to issue complaint handling instructions to its teams, update its complaints management system with alerts and notifications, and update its website and social media channels with information about available contact methods for the provider, how the TIO can assist with complaints and what the consumer's rights are.

On the day of the outage, the TIO became aware of the outage via media reports and contacted Optus at 8:12am to seek information that it could provide to consumers and to its own complaint handlers. Optus provided an update to the TIO at 11:32am noting issues with Triple Zero, that Optus was working to restore services as soon as possible and outlining the available contact avenues for consumers and where they could go for information.

The TIO contacted Optus again in the early afternoon to request information to help the TIO plan how it would respond to consumers contacting the TIO for assistance and to discuss Optus' resourcing for responding to TIO complaints. Later in the afternoon Optus responded that services were gradually being restored and that it had plans to set up a dedicated onshore team to handle TIO queries with further information to follow.

On 9 November, the TIO confirmed it would use its standard complaint handling processes for complaints following the outage. Optus contacted the TIO to note that its dedicated onshore complaints handling team had been set up for the TIO to refer consumers to if they wanted to escalate their complaint.
All communication channels remained open, such as retail, voice and messaging, with resources being mobilised to optimise capacity, and it provided the TIO with links it could share or publish about contacting Optus. Optus noted that contact volumes remained high but were expected to decrease early the following week.

Further, on 9 November, Optus announced it would provide mobile customers on eligible plans, and eligible prepaid customers, with extra data as compensation for the outage. Media reports indicate general dissatisfaction with the offer. Optus home internet customers received faster internet speeds for the month of December as a form of compensation.

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[22] See Competition and Consumer Amendment (Fair Go for Consumer and Small Business) Bill 2024
[23] See Federal Register of Legislation - Competition and Consumer Act 2010

The TIO published information on its website on the day of the outage and continued to publish updates throughout the day and in the following days containing specific information advising consumers how to contact Optus, how the TIO could help and giving information about compensation. The TIO and Optus continued to work with each other over the course of the week to discuss complaints, resourcing and updated consumer information.

Areas for improvement and change

The TIO's complaint handling and compensation arrangements and powers work well but the Optus outage has highlighted opportunities for the TIO to expand and formalise its arrangements in times of crisis, and for the industry to improve its collaboration with the TIO during these events.

The TIO suggested that providers should consider, as soon as practical, a standardised approach to the types of resolutions that may be available to consumers impacted by a crisis situation and communicate this to the TIO, the ACMA and publicly. The TIO considers that communicating an approach to resolutions will ease the burden on customer service channels and free up dispute resolution resources to focus on individualised remedies for those disproportionately affected by an outage or other crisis situation.

The TIO recommends that the Department or ACMA consider whether the current definition of a complaint in the Complaints Handling Standard meets community expectations in relation to crisis events. The TIO noted that the way a complaint is defined can have a flow on effect for the way a provider handles the complaint and whether or not the complaint is captured for reporting purposes.

The Review supports both of these proposals.

A standardised approach to compensation for outages of this kind would be appropriate. Requiring very large numbers of customers to initiate individual complaints in a situation where the fault and its impact is known is unfair to consumers and wasteful of resources in both telecommunications providers and the TIO.

A super-complaint system enabling complaints to be made by or on behalf of a class of customers, or a class order system enabling the TIO to order compensation for a class of customers, would be an appropriate reform in this area. Given the introduction of the above-mentioned designated complaints function later this year, it may be that a similar model could be adapted for use by the TIO in response to large scale outages.

The TIO noted in its Senate Inquiry submission that a preliminary view of complaints showed a majority of consumers said they were seeking some kind of compensation either generally or specific requests for account credit, refunds of service charges paid, non-financial loss and financial loss.

The only formal automatic compensation arrangement in the telco sector, the CSG, requires providers to connect or repair landline services within a maximum time period, and outlines the amount of compensation that is payable if the provider fails to meet those timeframes. The CSG does not cover retail broadband services or mobile phone services and excludes outages caused by Major Service Disruptions.

As part of the Department's ongoing oversight of the CSG, the TIO suggests consideration of whether updated compensation arrangements could better reflect consumer expectations and clarify any changes to compensation where a crisis occurs. This would present a number of practical challenges as the CSG framework is well adapted only to fixed line voice services to which it currently applies.

Recommendations

12. The Complaints Handling Standard and related Record Keeping Rules should be amended to ensure they account for the impacts of network outages and that the definition of complaint in the Standard meets community expectations in relation to crisis events.

13. An industry wide standardised approach to the form of resolutions available to consumers affected by a crisis or large-scale outage should be implemented.

    This standardised approach should address the possible forms of compensation and penalties applicable to loss of service during outages, enabling the TIO to address mass events without requiring large numbers of individual complaints, investigations and resolutions. While it is not intended that this measure replace the Customer Service Guarantee, it could provide a similar framework through which outages affecting more than fixed line voice services are considered.

TOR 5 – Other: Resilience and interdependencies

Description of existing arrangements

The Department is responsible for several arrangements that support the resilience and interdependency of the telecommunications system.

Cyber security issues

The telecommunications ecosystem, as part of the communications system, is critical infrastructure under the *Security of Critical Infrastructure Act 2018* [24] (SOCI Act) and its protection is considered important to our defence, national security, economic and social stability.[25]

Protection of critical infrastructure is managed by the Cyber and Infrastructure Security Centre[26] (the CISC) within the Department of Home Affairs. The CISC points out that an MSD affecting one item of critical infrastructure can have flow on effects to other infrastructure. Under the SOCI Act, owners and operators of telecommunications infrastructure under the *Telecommunications Act 1997*, provide operational and ownership information to the Register of Critical Infrastructure Assets and notify the CISC of any cyber security incidents which impact the delivery of essential services.[27] This only applies to cyber security matters and not general outages.

Grants and programs

The Department administers several co-investment programs aimed at providing better connectivity to users. Some of these programs go directly to network resilience measures (for example, battery backup for mobile towers) or help to fund infrastructure investment in regional areas (thereby helping to maximise network connectivity options and redundancy for regional consumers).

- The Mobile Network Hardening Program and the Strengthening Telecommunications Against Natural Disasters programs are government funded resilience programs designed to strengthen communications during natural disasters.[28]
- The Regional Connectivity Program, funds various place-based telecommunications infrastructure projects to improve digital connectivity across regional, rural and remote Australia.[29]
- The Mobile Black Spots Program, under which the Government and telecommunications companies co-invest in telecommunications infrastructure to improve mobile coverage and competition across Australia.[30]

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[24] See Federal Register of Legislation - Security of Critical Infrastructure Act 2018
[25] See Communications (cisc.gov.au)
[26] See Cyber and Infrastructure Security Centre (cisc.gov.au)
[27] See Telecommunications (cisc.gov.au)
[28] See Mobile Network Hardening Program | Department of Infrastructure, Transport, Regional Development, Communications and the Arts
[29] See Regional Connectivity Program | Department of Infrastructure, Transport, Regional Development, Communications and the Arts
[30] See Mobile Black Spot Program | Department of Infrastructure, Transport, Regional Development, Communications and the Arts

Temporary disaster roaming

Temporary disaster roaming is the capability for a consumer device to connect to a mobile network not owned or operated by the customer's mobile network provider during a specified emergency event, for a limited time and in a limited geographical area that is not determined by mobile network operators but specified by federal/state/territory governments in consultation with emergency agencies.[31]

On 23 October 2023, the Australian Government announced it would work with industry to scope an emergency mobile roaming capability to keep Australians connected during natural disasters.[32]
The Department and NEMA are progressing this work in collaboration with mobile carriers and will report back to Government in March 2024.

As discussed in relation to TOR 1, 'camp on' arrangements are mandated in Australia for emergency calls, allowing calls from mobiles to be carried on other available networks where a person's home network is down or has no coverage. It is important to note that temporary roaming is a technically different solution.

Comparison with other industries and jurisdictions

Energy sector resilience

The energy sector provides an example of how another industry addresses emergency supply problems through its Retailer of Last Resort (RoLR) scheme.[33] Under the scheme, customers are transferred to another provider if their current provider exits the market, ensuring they have a continuous supply of gas or electricity with a nominated RoLR. It is important to note there are clear technical differences between the supply of energy and telecommunications. The RoLR scheme also applies in different circumstances (market exit) from the Optus outage.

As noted in the discussion regarding TOR 2, the Government's policy is to intervene in energy supply emergencies only if the industry has attempted all other avenues to address the problem. Instead, it supports emergency management forums designed to ensure the Commonwealth, state and territory governments and industry can work together to develop emergency plans and procedures. Also as noted above, the Department of Climate Change, Energy, the Environment and Water provides secretariat support for the Electricity Sector Group, which is part of the TISN.[34]

United States of America

In the wake of several natural disasters, the US Federal Communications Commission (the FCC) introduced a Mandatory Disaster Response Initiative (MDRI), FCC 20-50[35], to improve the reliability and resilience of mobile wireless networks that are a significant lifeline for those in need during disasters and other emergencies.

The MDRI is based on an industry-developed, voluntary framework[36]. It codifies and makes mandatory five approaches, set out in the Framework, that telecommunications companies must adopt to improve coordination and maintain services during a disaster:

- Provide for reasonable roaming under disaster arrangements when technically feasible
- Foster mutual aid among wireless providers during emergencies

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[31] See ACCC Regional Mobile Infrastructure Inquiry Final Report.pdf (dotars.gov.au), page 82.
[32] See Government to scope emergency mobile roaming capability during natural disasters
[33] See Retailer of Last Resort
[34] See Energy infrastructure resilience - DCCEEW
[35] See FCC-22-50A1_Rcd.pdf
[36] See CTIA - Wireless Network Resiliency Cooperative Framework

- Enhance municipal preparedness and restoration by convening with local government public safety representatives to develop best practices, and establishing a provider/Public Safety Answering Point contact database
- Increase consumer readiness and preparation through development and dissemination with consumer groups of a Consumer Readiness Checklist
- Improve public awareness and stakeholder communications on service and restoration status, through the FCC posting aggregated, county-by-county data on outages in the relevant area.

Canada

The Canadian Memorandum of Understanding on Telecommunications Reliability[37] requires signatories to:

- Allow for emergency roaming between them
- Communicate with each other
- Provide each other with assistance

during an access network failure, for example, towers being disabled during a natural disaster.

Canada is currently investigating roaming in circumstances more similar to the Rogers and Optus outages, that is, involving core network failures.

The MOU is binding and valid for 5 years, then it renews automatically for a year, year by year, unless and until the parties all decide not to be a part of it. Innovation, Science and Economic Development Canada (the ISED) has advised that three principles underlined the creation of the MOU:

- Emergency roaming was an important part of any strategy to address the effects of a large-scale outage
- Communications between the carriers during and about the outage had to be addressed
- A formal process for mutual aid between carriers was necessary.

Under the MOU, the carriers will accept roamers but do not have to degrade their own customers' experience to achieve that. Roamers receive what they call "basic emergency roaming", that is, enough capacity for emergency calls, text messages and some other, minor applications. It contains guidelines on how to start emergency roaming but it is not automatic, rather the carriers have to agree on a start time and finish time.

Emergency roaming is the joint responsibility of the ISED and the CRTC; in our terms, the Department and the ACMA.

United Kingdom

Recognising telecommunications networks as a vital component of the UK's Critical National Infrastructure, a Memorandum of Understanding between members of the Telecommunications Industry Emergency Planning Forum states members will cooperate in emergency situations through the sharing of human and material resources.

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[37] See Memorandum of Understanding on Telecommunications Reliability (canada.ca)

Areas for improvement and change

Temporary mandatory disaster roaming

Carriers largely maintain that temporary disaster roaming is either not feasible or should only take place in very limited circumstances. Reasons given include:

- There is a risk that large numbers of customers roaming from a network affected by an outage could overwhelm the network to which they roamed, causing it to also fail
- Roaming would be highly complex, involving what one submission described as "significant technical and operational challenges", and have to be carefully designed, as well as expensive to implement.

Nevertheless, limited roaming has been successfully implemented in other countries to deal with emergencies and associated outages and implementation should be pursued in the Australian context.

Some countries have implemented roaming and asset sharing for competition reasons (such as the United Kingdom, New Zealand and Norway).

Current work considering the feasibility of temporary disaster roaming in Australia during natural disasters is due to be completed in March 2024.

Telecommunications Resilience

The outage and Triple Zero issues were caused by preventable risks, that were seemingly unknown to Optus. In addition to continuing resilience programs, it is clear that a more structured approach to network and Triple Zero resilience testing is required, which is the subject of Recommendation 3.

This structured approach should also be applied to network architecture. In the case of the Optus network outage, when the Optus core network went down, core network routing was also lost. This resulted in Optus engineering staff being unable to remotely access the infrastructure via an alternative means (the out of band network), despite Optus having a separate management network.

The flow on impact of this was that there was no ability to trigger wilting that had not automatically occurred on the 3G voice network. While the management network was separate from other elements of the network, it could not operate independently of the network.

Carriers should put in place measures to ensure that network operators have alternative means by which they can force or trigger change in the event of a core outage. As noted in the Background above, Optus has indicated that it is implementing such measures.

Mutual assistance

In Canada, mutual assistance (under the Memorandum of Understanding on Telecommunications Reliability) consists of, for example, sharing of physical assets, such as buildings, and vehicles; sharing of equipment or logistical support, subject to applicable licensing terms; sharing of staff or human resources; and the provision of SIM cards to key personnel in other providers, so the affected provider can communicate internally when its system is not operating.

Australian industry participants should implement mutual assistance initiatives of this sort (see Recommendation 15).

Community resilience and preparedness

Australia should investigate opportunities to become better prepared for outages, including through education initiatives. The FCC's Consumer Readiness Checklist serves as a useful example. Recommendation 11 above proposes governments take steps to build awareness of, and preparedness for, network outages.

Recommendations

14. Work currently being undertaken on roaming during natural disasters should be followed by work on temporary roaming during outages caused by other events, such as those which occurred on 8 November 2023. That work should be undertaken with reference to international experience as to cost and feasibility.
15. The Australian Government should require mutual assistance arrangements to be established between telecommunications service providers during outages to assist in managing and resolving those outages, learning from international experience (for example, similar to the Canadian MOU).
16. Network operators should be required to establish the ability to remotely access and activate network management tools, and have sufficient network redundancy to deploy them, in the event of a core network outage.
17. Australian governments should review arrangements for maintaining their operations during outages including telecommunications redundancy for critical government services. Consideration should also be given to maintaining this information in central repository.
18. The Department and the ACMA should institute a review of all legislation and regulation relating to Triple Zero, with a clear focus on the recommendations of this Review and the outcomes of the ACMA's investigation regarding the Optus outage.

Attachment A

Terms of Reference

1. The functioning of Triple Zero during the outage, including contrasts to other outages, and whether changes are required to:
    a. the technical settings required to ensure the continued access to Triple Zero by users whose network is experiencing outages
    b. the regulatory settings required to ensure the continued access to Triple Zero by users whose network is experiencing outages
    c. the circumstances in which other networks may be relied on to support a network that is subject to a major outage
    d. the interaction between carriers, carriage service operators, Mobile Virtual Network Operators (MVNOs), the Emergency Call Person and other participants in the telecommunications sector to ensure the continued access to Triple Zero by users whose network is experiencing outages (including an examination of existing processes).
2. The role of Government in managing and responding to national service outages, including but not limited to:
    a. coordination between government agencies at all levels
    b. public messaging by government agencies during such outages, and in particular, the outage.
3. The adequacy of requirements for customer communication in national service outages.
4. The adequacy of how customer complaints processes and compensation processes performed for consumers and small business following the outages.
5. Other telecommunications sector implications, including resilience and interdependencies between telecommunications networks.

Excluded from scope of the Review will be:

- The extent to which Optus complied with current regulatory obligations, including the Emergency Call Services Determination. These are matters for the Australian Communications and Media Authority.
- The technical causes of the Outage, and the manner in which Optus remediated the outage. This is a matter for Optus to investigate and report on.
- The adequacy of the value of any compensation offered by Optus. In accordance with Terms of Reference 4, this inquiry will focus on the performance of the processes that were available to consumers and small businesses.

Attachment B

Optus Public Communications - 8 November

Time	Event
6.33am	Optus spokesperson said: • Optus is aware of an issue that may be impacting some of our mobile and internet customers • We are currently working to identify the cause and apologise for any inconvenience • In case of emergency, customers can still call 000
6.47am	Optus social media post (Facebook and X) *We're aware of an issue impacting Optus mobile and NBN services and are working to restore services as quickly as possible. We understand connectivity is important and apologise for any inconvenience caused.*
8.16am	Optus Spokesperson said: • We are aware of an outage impacting our customers • Our teams are working to restore services as soon as possible • We will provide an update as soon as we are able • Optus apologises sincerely to our customers
8.27am	My Hub Banner alert to all frontline Optus staff via standard communications portal
8.31am	Social Media post (Facebook and X) *Our teams are working urgently to restore services. We will provide updates as soon as possible.*
9.33am	An Optus spokesperson said: • We are aware of an outage impacting our customers • Our teams are working to restore services as soon as possible • We will provide an update as soon as we are able • Optus apologises sincerely to our customers • Optus can confirm that triple zero (000) calls will not work from an Optus landline (fixed line telephone). Mobile calls to 000 will work if another carrier is available. We encourage any customers who need to contact emergency services to use a mobile line to call 000
10.09am	An Optus spokesperson said: *We encourage any customers who need to contact emergency services to use a mobile line to call 000. Optus can confirm that triple zero (000) calls will not work from an Optus landline (fixed line telephone). Mobile calls to 000 will work if another carrier is available.*
10.14am	An Optus spokesperson said: • We are aware of an outage impacting our customers

Time	Event
	• Our teams are working to restore services as soon as possible • We will provide an update as soon as we are able • Optus apologises sincerely to our customers • We encourage any customers who need to contact emergency services to use a mobile line to call 000. Optus can confirm that triple zero (000) calls will not work from an Optus landline (fixed line telephone). Mobile calls to 000 will work if another carrier is available
10.17am	Social media post (Facebook & X) *We encourage any customers who need to contact emergency services to use a mobile line to call 000. Optus can confirm that triple zero (000) calls will not work from an Optus landline (fixed line telephone). Mobile calls to 000 will work if another carrier is available*.
10.40am	Optus CEO Radio interview – ABC Mornings
12.11pm	Optus CEO Radio interview – 3AW
12.24pm	Optus CEO Radio interview – 2GB
12.55 -12.56pm	Three Social media posts (Facebook & X) • Some Services across fixed and mobile are now gradually being restored. This may take a few hours for all services to recover and different services may restore at different sites over that time • We reiterate our apology to customers for the nationwide service outage that has occurred this morning. We will continue to provide updates as we have information available • We are aware of some mobile phones are (sic) having issues connecting to 000. If Optus customers need to call emergency services, we suggest finding a family member or neighbour with an alternative device
1.05pm	An Optus spokesperson said: • We reiterate our apology to customers for the nationwide service outage that had occurred this morning • Some services across fixed and mobile are now gradually being returned • This may take a few hours for all services to recover and different services may restore at different sites over that time • We are aware of some mobile phones having issues connecting to 000. If Optus customers need to call emergency services, we suggest finding a family member or neighbour with an alternative device
2.00pm	An Optus spokesperson said: • We have no indication that the outage is cyber related.

Time	Event
4.00-5.00pm	Optus CEO conducts successive TV interviews - Seven, Nine, Ten, ABC – confirming restoration of services. Optus spokesperson said: • We reiterate our apology to customers for the nationwide service outage that had occurred this morning • Some services across fixed and mobile are now gradually being returned • This may take a few hours for all services to recover and different services may restore at different sites over that time • We are aware of some mobile phones having issues connecting to 000. If Optus customers need to call emergency services, we suggest finding a family member or neighbour with an alternative device.
5.20 – 5.50pm	Optus CEO conducts successive with print journalists – Australian Financial Review, Sydney Morning Herald, The Australian, Daily Telegraph
5.28pm	An Optus spokesperson said: • Optus sincerely apologise to customers for today's outage • We know that customers rely on our services, which is why the whole team at Optus has been working hard to fix this • Service have now been restored, and customers should now be able to be back on line • We again thank customers for their patience
6.00-7.00pm	Social Media Posts (Facebook and Twitter) *The Optus Network has been restored and most services should now be back online. Some customers may need to restart their device or turn flight mode on and then off.* *Our people are doing their best to respond to your concerns and Optus sincerely apologises for today's outage.* *We again thank customers for their patience.* *Some services across fixed and mobile are now gradually being restored. This may take a few hours for all services to recover and different services may restore at different sites over that time.* *We reiterate our apology to customers for the nationwide service outage that had occurred this morning. We will continue to have updates as we have information available.* *We are aware of some mobile phones are having issues connecting to 000. If Optus customers need to call emergency services, we suggest finding a family member or neighbour with an alternative device.* *We encourage any customers who need to contact emergency services to use a mobile line to call 000. Optus can confirm that triple zero (000) calls will not work from an Optus landline (fixed line telephone). Mobile calls to 000 will work if another carrier is available.*

Attachment C

Information received

Submissions

- AMTA
- ACCAN
- ACCC
- ACMA
- Aussie Broadband
- Australian Small Business and Family Enterprise Ombudsman
- Business Council of Australia
- Commpete
- Communications Alliance
- Country Fire Authority Victoria
- Department of Government Services Victoria
- Department of Home Affairs
- Department of Premier and Cabinet South Australia
- Department of Prime Minister and Cabinet
- Department of Regional NSW
- Ericsson
- Fire and Rescue NSW
- Internet Association of Australia
- NBN Co
- NEMA
- NIAA
- NSW Fire and Rescue
- NSW Police Force
- NSW Small Business Commissioner
- Optus
- St John's Ambulance WA
- Tasmania Police
- Telstra
- TIO
- TPG Telecom
- Vocus
- WA Fire and Emergency Services
- Three private citizens

Meetings

- Australian Energy Regulator
- Australian Space Agency
- Canadian Radio-television and Telecommunications Commission
- Innovation, Science and Economic Development Canada
- Nova Systems
- Ericsson
- NSW Government, Fire and Rescue NSW, Department of Regional NSW
- NSW Telecommunications Authority
- Optus
- Telstra
- University of Melbourne Centre for Disaster Management and Public Safety