Guidelines for Telecommunications Operators
for Reporting Network/Service Outages and Emergency Incidents

Communications Authority

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1   Purpose

1.1   The guidelines set out in this document (the "Guidelines") are issued under Special Condition ("SC") 1.2(e) of Unified Carrier Licence ("UCL") and SC 12.1(d) of Services-based Operator ("SBO") Licence for the purpose of providing practical guidance to licensed operators in respect of correct, efficient and reliable operation of telecommunications.

1.2   In this document, "operator" means –

   (a)   a fixed network operator holding a UCL authorised to provide internal and/or external fixed services;

   (b)   a mobile network operator holding a UCL authorised to provide mobile services; or

   (c)   an SBO holding an SBO Licence for the provision of –

         (i)   Class 1, Class 2 or Class 3 (Mobile Virtual Network Operator) services which are using subscribers numbers[1] allocated by the Communications Authority; or

         (ii)   Class 3 (Internet Access Services) or Class 3 (International Value-Added Network) services for the delivery and exchange of inter-operator short messages services ("IOSMS") among telecommunications networks.

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[1]   A subscriber number is a number in "The Numbering Plan for Telecommunications Services in Hong Kong" for assignment to the end customer for the provision of telecommunications services.

2 Introduction

2.1 Public telecommunications networks and services form a critical part of the information infrastructure in Hong Kong. They are critical to the normal functioning of the society and economy. The timely and accurate provision of information by operators on public telecommunications network and service outages and emergency incidents is essential to maintain and improve the reliability of Hong Kong's telecommunications infrastructure as it provides the basis for the Office of the Communications Authority ("OFCA") or the Government to take the necessary emergency response actions to address public concern and to determine whether the outage or emergency incident or the pattern of it justifies intervention or coordination with the industry to prevent similar recurrence.

2.2 In the event of a network/service outage or an emergency incident, the operators, having the first-hand information about the operational status of their networks and services, shall report the outage or incident to OFCA in accordance with the triggering criteria and timeframe set out in **Annex A** of this document. They shall also provide prompt information and advice to their customers about the outage/incident.

3 Reportable Network/Service Outages and Emergency Incidents

3.1   An outage is defined as a loss of or a significant degradation in the ability of the customer to establish and/or maintain a channel of communications as a result of failure or degradation in the performance of an operator's network or service. In addition to incidents of software or hardware outage, significant degradation occurs when traffic produces excessive demands on available system resources, resulting in switch congestion or system overload.

3.2   An emergency incident is defined as an incident occurring at or in connection with a telecommunications facility (e.g. manhole, telephone exchange, mobile switching centre, short message service centre, and telecommunications control centre) that has caused or has the potential of causing injury to or death of any person.

3.3   The triggering criteria, timeframe for reporting network/service outages and emergency incidents, and relevant examples as set out in **Annex A** are by no means exhaustive. Operators shall, whenever necessary, report to OFCA on other events or incidents that may have significant impact on their normal network operation or services or that has the potential of causing injury to or death of any person.

4 Reporting Network/Service Outages and Emergency Incidents

Reporting and updating status of an outage or emergency incident to OFCA

4.1   The flowcharts showing the main steps for reporting a network/service outage or an emergency incident are at **Annex B**.

4.2   When reporting an outage or emergency incident to OFCA, the operator concerned shall provide OFCA with the following information, whenever possible –

(a)   full name of the operator;
(b)   affected service(s);
(c)   description of the incident;
(d)   date and time of onset of the incident;
(e)   types and estimated number of customers/end-users affected;
(f)   estimated number of injuries/deaths (for emergency incident only);
(g)   affected area(s);
(h)   actions taken; and
(i)   contact information: name of contact person, his/her Hong Kong fixed and mobile contact numbers and email address.

4.3   The operator concerned shall report the outage or emergency incident to OFCA by phone and/or email.   A template of the situation report on network/service outage or emergency incident is at **Annex C**.

4.4   During the recovery stage of outage, the operator concerned shall timely inform OFCA of the status of the affected network/service.   Under critical circumstances, OFCA may specify the update frequency and the information to be provided by the operator concerned to facilitate the assessment on the impact of the outage and the progress of recovery of the affected network/service.

Network health check under significant earthquakes

4.5   OFCA has arranged with Hong Kong Observatory ("HKO") to relay reports on a significant earthquake[2] to relevant operators automatically.   The

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[2]   Significant earthquake refers to an earthquake which (a) has been felt by local residents; (b) is of magnitude 5.0 on Richter Scale or above and within 1 000 km from Hong Kong; or (c) occurred at places of special interest.

operators shall conduct a network health check and report to OFCA any anomaly found upon receipt of a significant earthquake report from HKO.

4.6   To facilitate a prompt response, OFCA may make telephone or email enquiry with the operators concerned about their network/service status.

5   Submission of Incident Reports

Preliminary report

5.1   Where required by OFCA, the operator shall submit a preliminary report on the network/service outage or emergency incident to OFCA within three (3) working days after the incident (or such other date as specified by OFCA).

5.2   The preliminary report shall include the following information –

(a)   description of the incident;
(b)   date and time of onset of the incident;
(c)   events which lead to the occurrence of the incident;
(d)   affected services;
(e)   number of customers/end-users affected;
(f)   affected area(s);
(g)   remedial actions taken; and
(h)   communications with OFCA, customers and the public.

Full report

5.3   Where required by OFCA, the operator shall submit a full report on network/service outage or emergency incident to OFCA within 14 working days after the incident (or such other date as specified by OFCA).

5.4   In addition to items (a) to (h) of paragraph 5.2 above, the full report shall provide information on the root cause of the incident and measures that have been/will be taken to prevent recurrence of similar incidents as far as practicable.

5.5   The operators may provide a confidential version and a public version of the preliminary report and full report, if deemed necessary.

6   Contact Points of Operators and OFCA

6.1   Operators shall provide OFCA with the contact information of their focal points for the communication on possible network/service outages and emergency incidents (comprising at least one duty officer and one officer at supervisory or managerial level, both of whom shall be available 24 hours per day, seven days per week) including –

    (a)   names;
    (b)   Hong Kong fixed and mobile contact numbers; and
    (c)   email addresses.

6.2   Operators shall notify OFCA of any change of the contact information as soon as practicable.

6.3   OFCA's contact points for reporting outage or emergency incident are as follows –

	Tel. No.	**Email**
First Contact	✂	✂
Second Contact	✂	✂

Other general enquiries should be made to ers-coordinator@ofca.gov.hk.

7   Dissemination of Information to Customers by Operators

7.1   In the event of a network/service outage or an emergency incident, the operator concerned shall endeavour to disseminate information on the outage or emergency incident, in an expeditious and effective manner, to affected customers.   For critical network/service outage (as listed in **Annex A**), the operator concerned should inform the affected customers within an hour after the corresponding triggering criteria for reporting the outage are met.   The information to be disseminated to affected customers shall include, as far as possible, starting time of the network/service outage or the emergency incident (as the case may be), the type of service affected, and the estimated restoration time.

7.2   When the network/service outage is restored, the operator concerned shall notify the affected customers within one hour after the affected network/service is restored.

7.3   When communication channels are severely interrupted by the outage or emergency incident, the operator concerned is encouraged to make a public announcement over mass media channels.   The use of public announcement is not applicable to operators that do not provide service to end users.

8   Effective Date of the Guidelines

8.1   The Guidelines take effect starting from 11 July 2023. Operators should have adequate time to familiarise with the Guidelines and ensure compliance with the requirements therein from the date specified above.

Communications Authority

11 April 2023

Triggering Criteria, Timeframe for Reporting
Network/Service Outages and Emergency Incidents, and Relevant Examples

Triggering Criteria

Network/Service		Duration and extent of outage		
		Critical	Major	Extent
Local voice / Signalling / Infrastructure	Point of interconnect ("PoI") switches	>5 mins	-	• Failure of one or more PoI switch(es)
	Signalling points, gateway number ("GN") database	>15 mins	-	• Failure affecting the operation of a signalling point, call dipping
	999 routes, airport, switch failure	>15 mins	-	• Failure affecting 999 routes or normal operation of airport, causing partial or complete outage; or • Failure of one or more switching unit(s)
	Network congestion	-	>15 mins	• 85% of calls with dial tone delay for more than 3 seconds
	Administration database ("AD") for number portability	-	>60 mins	• Failure of any AD or communication link

	Cabling facilities, Internet Protocol ("IP") telephony	>120 mins (cabling facilities) >60 mins (IP telephony)	-	• ≥5 000 or ≥25% of total lines/circuits/IP telephony end-users affected
		-	>120 mins	• ≥2 000 lines/circuits/IP telephony end-users affected
	Short message service ("SMS")	>60 mins	-	• Failure causing complete SMS delivery failure
	Base station controller ("BSC") or unit with equivalent function	-	>120 mins	• Failure of one or more unit(s)
Data / Internet	Connectivity to Internet exchange points (e.g. HKIX), local peers or destinations in Mainland China, United States/North America, United Kingdom/Europe, or Asia Pacific region	>30 mins		• Loss of ≥50% of total bandwidth; • Total bandwidth utilisation ≥95%; or • Total bandwidth utilisation ≤50% (with reference to the date/time of the previous week)
	Core network components such as domain name servers (DNS), routers or switches	>30 mins		• Degradation of service or failure of components that would affect/potentially affect ≥10 000 users
	Components for user access such as dynamic host configuration protocol (DHCP) or authentication servers	>45 mins		

External	Submarine cable system	>30 mins	• Dual failures of two fishbone/linear systems or failure in a ring or other type of system, causing Hong Kong to be unable to communicate with other places by means of such system(s); or • Loss of >50% of backhaul capacity
	Overland cable system	>30 mins	• Failure in a system causing Hong Kong to be unable to communicate with Mainland China by means of such system; or • Loss of >50% of total activated or backhaul capacity of a system between Hong Kong and Mainland China
	Other than submarine or overland cable system	>30 mins	• Loss of >50% of total activated capacity between Hong Kong and another place
Emergency incident	Fire or explosion at manhole/joint box, telephone exchange, mobile switching centre, IOSMS centre or telecommunications control centre	Emergency incident occurs and has been identified by the operators concerned	-

Timeframe for Reporting to OFCA

Network/Service	Initial Report			
	Critical		Major	
Local voice / Signalling / Infrastructure	*From 07:30 to 21:00 except Sundays/Public Holidays* within 15 minutes after triggering criteria ("TC") is met	*From 21:00 to 07:30 of next day or on Sundays/Public Holidays* within 1 hour after TC is met	*From 07:30 to 21:00* within 1 hour after TC is met	*From 21:00 to 07:30 of next day* within 1 hour after TC is met or by 08:30, whichever is later
Data / Internet	*Between 08:30 and 01:00 of next day* within 1 hour after occurrence of outage		*Between 01:00 and 08:30* within 1 hour from occurrence of outage or by 08:30, whichever is later	
External	*Between 00:00 and 24:00 of each day* within 2 hours from confirmation of outage or 4 hours after occurrence of outage, whichever is earlier			

Emergency incident	*From 07:30 to 21:00*	*From 21:00 to 07:30 of next day*
	within 1 hour after incident has been identified	within 1 hour after incident has been identified or by 08:30, whichever is later

Network/Service	Restoration of Network/Service			
	Critical		Major	
Local voice / Signalling / Infrastructure	*From 07:30 to 21:00 except Sundays/Public Holidays*	*From 21:00 to 07:30 of next day or on Sundays/Public Holidays*	*From 07:30 to 21:00*	*From 21:00 to 07:30 of next day*
	within 1 hour	within 4 hours	within 4 hours	within 4 hours or by 08:30, whichever is later
Data / Internet	*Between 08:30 and 01:00 of next day*		*Between 01:00 and 08:30*	
	within 2 hours		within 2 hours or by 08:30, whichever is later	
External	*Between 00:00 and 24:00 of each day*			
	within 1 day			

Emergency incident	*From 07:30 to 21:00*	*From 21:00 to 07:30 of next day*	*From 07:30 to 21:00*	*From 21:00 to 07:30 of next day*
	within 1 hour	within 4 hours	within 4 hours	within 4 hours or by 08:30, whichever is later

Examples of Network/Service Outages and Emergency Incidents

Network/service		**Examples** (non-exhaustive)
Local voice / Signalling / Infrastructure	PoI switches	• Failure of a duplex common control unit, front end processor or internal bus in the switch; • Failure of a duplex signalling equipment; • Loss of all signalling links; • Significant message handling/routing failure or traffic 'black hole'; or • Link congestion exhibited by excessive message loss for 15 minutes or more
	Signalling points (e.g. Signal Transfer Point, Service Control Point)	• Failure of both mated pairs of a duplex front end processor; • Failure affecting the operation of Home Location Register (HLR), Visitor Location Register (VLR) or unit with equivalent function; • Failure of Unified Data Management (UDM); • Loss of 30% or more of normal handling capacity; • Significant message handling/routing failure or traffic 'black hole'; or • Failure causing a switch/local exchange/mobile switching centre to become isolated
	GN database	• Failure affecting all call dipping of ported fixed and mobile numbers
	999 routes	• Failure of cable(s) and/or equipment that causes partial or complete service outage of 999 routes to Police's emergency centre
	Airport	• Failure of cable(s) and/or equipment that causes partial or complete service outage to Air Traffic Control Centre, Passenger Terminal Complex and Airport Police Station

	Switch (including local/tandem exchange, international toll exchange, mobile switching centre)	• Failure of a duplex common control unit or front end processor; • Loss of a switch such as loss of all input power or generic/memory corruption in a switch; • Loss of ringing feature on the terminating end; • 85% of calls with dial tone delay of 3 seconds or more for 15 continuous minutes due to a loss of common or service circuits; • Loss of inter-exchange call capabilities (isolation) for 15 minutes or more; or • Failure of more than 30% of the working BSC (or unit with equivalent function) of a mobile network for 15 minutes or more
	Cabling facilities	• Damage of cabling facilities such as ducts and cables by road opening or other civil works
	IP telephony services	• Failure of softswitch affecting 5 000 or more IP telephony end-users for more than 60 minutes; or • Failure of core router/switch or other equipment affecting 2 000 or more IP telephony end-users for more than 120 minutes
	SMS	• Failure of all Short Message Service Centres ("SMSCs"); • Failure of all connections between SMSCs and mobile switching centres; • Failure of all connections between a mobile network and all IOSMS networks; or • Failure of all connections between an IOSMS network and all mobile networks
Data / Internet		• Loss of 50% or more of the total connection bandwidth to Internet exchange points (e.g. HKIX); • Loss of 50% or more of the total bandwidth to destinations in Mainland China, United States/North America, United Kingdom/Europe, or Asia Pacific region; • 95% or more of the total bandwidth utilisation of connections to Internet exchange points (e.g. HKIX) for 30 minutes; or • Failure of core router/switch or other equipment causing 10 000 or more users unable to access to the Internet

External	Submarine Cable System	• Damage of submarine cable by ship anchor, fishing dredge, earthquake or other reasons; or • Multiple failures in the backhaul links leading to a loss of more than 50% of the backhaul capacity of a submarine cable system within Hong Kong
	Overland Cable System	• Damage of overland cable by accident, vandalism, road opening, earthquake or other reasons; • Failure(s) in overland cable system(s) leading to a loss of more than 50% of the total activated overland cable capacity between Hong Kong and Mainland China; or • Multiple failures in the backhaul links leading to a loss of more than 50% of the backhaul capacity of an overland cable system within Hong Kong
	External Network Facilities (other than Submarine Cable System and Overland Cable System)	• Failure(s) in facilities of submarine cable system(s) or overland cable system(s) leading to a loss of more than 50% of the total activated capacity between Hong Kong and another place; • Multiple failures in the backhaul links leading to a loss of more than 50% of backhaul capacity; or • Total failure in the main switch and standby switch
Emergency Incident		• Fire or explosion at manhole/joint box; or • Fire or explosion at telephone exchange, mobile switching centre, IOSMS centre or telecommunications control centre

Note: The list above is by no means exhaustive. Operators shall report other network/service outage and emergency incidents that are not covered in the list, if deemed necessary or upon request by OFCA.

Flowchart Showing the Main Steps for Reporting a Network/Service Outage

```
                        ┌─────────┐
                        │  Start  │
                        └────┬────┘
                             │
                             ▼
        ┌──────────────────────────────────────┐
        │ In the event of a network/service      │
        │ outage, the operator concerned shall   │
        │ report the outage to OFCA within the   │
        │ timeframe set out in the Guidelines    │
        └──────────────────┬─────────────────────┘
                           │
                           ▼
                    ◇ Is system                    No    ┌─────────────────────┐
                      normalisation       ───────────►   │ The operator concerned │
                      completed?                          │ shall inform OFCA of the │
                                                          │ status of the affected  │
                           │ Yes                          │ network/service         │
                           ▼                              └─────────────────────┘
```

The operator concerned shall report to OFCA within the timeframe set out in the Guidelines

Is preliminary report required?   No → End

Yes

The operator concerned shall submit a preliminary report to OFCA within three (3) working days after the incident or such other date as specified by OFCA

Is full report required?   Yes → The operator concerned shall submit a full report to OFCA within 14 working days after the incident or such other date as specified by OFCA

No → End

End

Flowchart Showing the Main Steps for Reporting an Emergency Incident

```
                          ┌─────────────┐
                          │    Start    │
                          └──────┬──────┘
                                 │
                                 ▼
              ┌────────────────────────────────────────┐
              │  In the event of an emergency incident, │
              │  the operator concerned shall report the│
              │  incident to OFCA within the timeframe  │
              │       set out in the Guidelines         │
              └────────────────────┬───────────────────┘
                                   │
                                   ▼
          No              ◇ Is preliminary report ◇
         ◄──────────────────    required?    
                                   │
                                   │ Yes
                                   ▼
              ┌────────────────────────────────────────┐
              │  The operator concerned shall submit a  │
              │  preliminary report to OFCA within three│
              │  (3) working days after the incident or │
              │  such other date as specified by OFCA   │
              └────────────────────┬───────────────────┘
                                   │
                                   ▼
                        ◇ Is full report ◇    Yes    ┌──────────────────────────┐
                             required?     ──────────►│ The operator concerned   │
                                   │                  │ shall submit a full      │
                                   │ No               │ report to OFCA within 14 │
                                   ▼                  │ working days after the   │
                               ┌───────┐              │ incident or such other   │
                               │  End  │◄─────────────│ date as specified by OFCA│
                               └───────┘              └──────────────────────────┘
```

**Template of the Situation Report on
a Network/Service Outage or Emergency Incident**

Please submit this completed form to OFCA at ✂.

(a) Full name of the operator	
(b) Affected service(s)	
(c) Description of the incident	
(d) Date and time of onset of the incident	Date : ____/____/_____ Time : ____ : ____ (dd/mm/yyyy)
(e) Types and estimated number of customers/end-users affected	
(f) Estimated number of injuries/deaths (for emergency incident only)	
(g) Affected area(s)	
(h) Actions taken	
(i) Contact information: name of contact person, his/her Hong Kong fixed and mobile contact numbers and email address	

Full Name   :   _____   Post Title :   _____

Tel. No.   :   _____   Email   :   _____

Date   :   _____