Telecommunications Regulatory Affairs Advisory Committee

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

PURPOSE

This paper seeks Members' views on the proposal of merging the existing "Guidelines for Local Fixed, Mobile, and Services-Based Operators for Reporting Network and Service Outage" ¹ and "Guidelines for Cable-based External Fixed Telecommunications Network Services Operators and Internet Service Providers for Reporting Network and Service Outage" ² (collectively "Existing Guidelines") into a single document for compliance by telecommunications operators.

BACKGROUND

Guidelines for reporting outages

2. Telecommunications licensees are required under General Condition 5.1 of the Unified Carrier Licence ("UCL") or Services-based Operator ("SBO") Licence to provide a good, efficient and continuous service in a manner to the satisfaction of the Communications Authority ("CA"). Pursuant to Special Condition ("SC") 1.2(e) of UCL and SC 12.1(d) of SBO Licence, the CA may issue guidelines for the purpose of providing practical guidance to the licensees in respect of correct, efficient and reliable operation of telecommunications.

¹ A copy of the document is available at <u>https://www.coms-auth.hk/filemanager/statement/en/upload/367/gn112016e.pdf</u>.

² A copy of the document is available at https://www.coms-auth.hk/filemanager/statement/en/upload/286/gn_201403e.pdf.

3. The Existing Guidelines have been in place for 15 years or more prior to the introduction of the above-mentioned SCs. They were issued and have been updated from time to time by the former Office of the Telecommunications Authority ("OFTA") and the Office of the Communications Authority ("OFCA") for the relevant operators to observe and follow³. Though not been expressly stated to be mandatory, the Existing Guidelines have throughout the years been observed by the operators in general.

THE NEED FOR UPDATE

Since the last update of the Existing Guidelines, 4. the telecommunications infrastructure has increasingly become a vital element for the normal functioning and sustainable development of Hong Kong's economy. Nowadays, the fixed and mobile networks underpin the operation of an information society carrying numerous calls. data messages and round-the-clock for personal communications, business transactions and access to public services and multimedia contents. With the advent of new emerging technologies including the fifth generation mobile systems, a wide range of communications services and innovative applications have been developed and adopted by various industry sectors. Further, as a major telecommunications and Internet hub in the region, Hong Kong is connected with the Mainland and the rest of the world through diverse submarine and overland cable systems which provide essential capacities and diversity for external telecommunications connectivity. These telecommunications networks, services and applications are a critical part of the information infrastructure in Hong Kong and are essential for the well-being of the society. If the continuous, reliable and secure operation of them is adversely affected by system failures, accidents, malicious attacks or other disruptions, this may cause serious harm to economic activities, public services, people's livelihood, and even national security.

³ The former OFTA issued in 1997 the "Guidelines Local Fixed and Mobile Network Operators for Reporting Network Outages to OFTA" which were updated in 2007, 2014 and 2016 by former OFTA/OFCA to cover Internet Protocol telephony services, SBOs and emergency incidents respectively. For Internet or external telecommunications services outages, the former OFTA issued in 2007 the "Guidelines for Cable-based External Fixed Telecommunications Network Services Operators and Internet Service Providers for Reporting Network and Service Outage" which were updated in 2011 and 2014 by former OFTA/OFCA to include overland cables and requirements to disseminate information to affected customers respectively.

5. Against this background, it is considered necessary to formalise the reporting requirements under the Existing Guidelines by issuing them under the relevant licence condition for compliance by the relevant operators and further strengthening OFCA's regulatory oversight and coordination with operators in handling outages and emergency incidents. Opportunity is also taken to streamline and merge the two sets of the Existing Guidelines into a single document for ease of reference and observance by the operators.

THE PROPOSAL

6. Having reviewed the requirements under the Existing Guidelines and having regard to the experience gained from the implementation of the Existing Guidelines, OFCA has prepared a draft of the "Guidelines for Telecommunications Operators for Reporting Network/Service Outage and Emergency Incident" ("Proposed Guidelines") at **Enclosure**. The Proposed Guidelines essentially transplant the relevant requirements including procedures, triggering criteria and reporting timeframe from the Existing Guidelines, with necessary updates (e.g. to accommodate technology change, incorporating the existing arrangement of conducting network health check by operators upon OFCA's request under significant earthquakes) and some textual refinements where appropriate.

7. The Proposed Guidelines, which will be applicable for reporting of network/service outages and emergency incidents by all relevant operators including fixed network operators providing internal and/or external fixed services, mobile network operators providing mobile services and SBOs providing Class 1/Class 2 services, mobile services, Internet access services and other value-added services, comprise the following major contents –

- (a) Section 1: purpose and relevant operators;
- (b) Sections 2 and 3 and Annex A: introduction, triggering criteria and timeframe for reporting network/service outages and emergency incidents;
- (c) Section 4 and Annex B: procedures for reporting network/service outages and conducting network health check under significant

earthquakes;

- (d) Section 5: submission of incident reports;
- (e) Section 6: contact points of operators and OFCA;
- (f) Section 7: dissemination of information to customers by operators;
- (g) Section 8: effective date of the guidelines; and
- (h) Annex C: template of the situation report.

8. The reporting requirements under the Proposed Guidelines would be at the same level as the existing arrangements and requirements set out in the Existing Guidelines. Having regard to the increasing importance of telecommunications networks as part of the critical information infrastructure in Hong Kong and having made reference to the regulatory practice adopted by some advanced economies⁴, the Proposed Guidelines would be issued pursuant to the relevant licence conditions as set out in paragraph 2 above for mandatory compliance by the relevant operators.

9. OFCA also proposes that the Proposed Guidelines will take effect three months after their issue date. With introduction of such a grace period, relevant operators should have adequate time to familiarise with the Proposed Guidelines and better prepare themselves for compliance with the requirements therein.

VIEWS SOUGHT

10. Members are invited to give their views and comments on the proposal given in this paper.

⁴ For example, reporting of communications service disruptions / failures and incidents that have impact on critical telecommunications infrastructure / essential communications services or on public security, safety, health or economic well-being are mandatory in Australia, United Kingdom and United States.

NEXT STEP

11. Taking into account the feedbacks from the industry, OFCA will finalise the Proposed Guidelines and make recommendation on the matter to the CA for approval.

Office of the Communications Authority December 2022

DRAFT

Enclosure

GN-XX/2023

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

Communications Authority

Amendment History

Item	Issue No.	Issue Date	Paragraph/Section	Description

CONTENTS

- 1. Purpose
- 2. Introduction
- 3. Reportable Network/Service Outages and Emergency Incidents
- 4. Reporting Network/Service Outages and Emergency Incidents
- 5. Submission of Incident Reports
- 6. Contact Points of Operators and OFCA
- 7. Dissemination of Information to Customers by Operators
- 8. Effective Date of the Guidelines

Annex A Triggering Criteria, Timeframe for Reporting Network/Service Outage and Emergency Incidents, and Relevant Examples

- Annex B Flowcharts Showing the Main Steps for Reporting Network/Service Outage and Emergency Incidents
- Annex C Template of Situation Report on Network/Service Outage or Emergency Incidents

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 numbers¹ 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.

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 earthquake² to relevant operators automatically. The

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 <u>ers-coordinator@ofca.gov.hk</u>.

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. 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 [Date + 3 months]. Operators should have adequate time to familiarise with the Guidelines and ensure compliance with the requirements therein from the date specified above.

Communications Authority

[Date]

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 /	Point of interconnect ("PoI") switches	>5 mins	-	• Failure of one or more PoI switch(es)
Signalling / Infrastructure	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)	-	•	\geq 5 000 or \geq 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 r	nins	•	Loss of \geq 50% of total bandwidth; or Total bandwidth utilisation \geq 95% or \leq 50% (with reference to the date/time of the previous week)
	Core network components such as domain name servers (DNS), routers or switches	>30 r	nins	•	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 r	nins		

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	Fire or explosion at manhole/joint box,	Emergency incident		-
incident	telephone exchange, mobile switching	occurs and has been		
	centre, IOSMS centre or telecommunications control centre	identified by the operators concerned		

Timeframe for Reporting to OFCA

Network/Service	Initial Report						
	Cr	itical	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 15 minutes after triggering criteria ("TC") is met	within 1 hour after TC is met	within 1 hour after TC is met	within 1 hour after TC is met or by 08:30, whichever is later			
Data / Internet	Between 08:30 ar	nd 01:00 of next day	Between 01:00 and 08:30				
	within 1 hour after	occurrence of outage		occurrence of outage hichever is later			
External		Between 00:00 and 2-	4:00 of each day				
	o	within 2 hours from cont or 4 hours after occurrence of o	e	er			

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					
	С	Critical	M	ajor		
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	0 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 c	and 01:00 of next day	Between 01	:00 and 08:30		
	with	in 2 hours	within 2 hours or by (08:30, whichever is later		
External Betwee		Between 00:00 and 2-	4:00 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

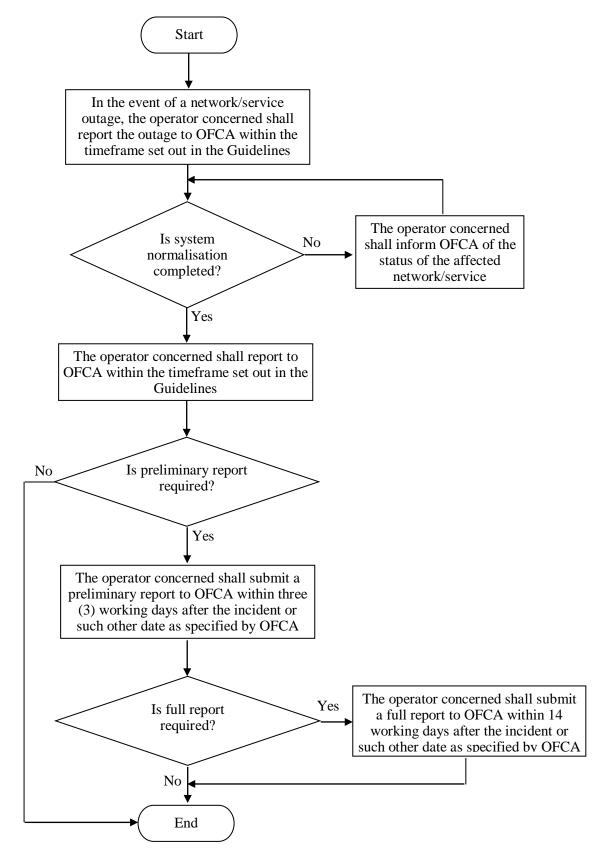
Network/serv	ice	Examples (non-exhaustive)		
Local voice / Signalling / Infrastructure	PoI switches	 Failure of a duplex common control unit, front end processor or internal bus in the switch; Failure of a duplex signalling equipment; Loss of all signalling links; 		
		 Loss of an signaling links, Significant 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 999 routes	 Failure affecting all call dipping of ported fixed and mobile numbers 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	• Failure of a duplex common control unit or front end processor;
(including	• Loss of a switch such as loss of all input power or generic/memory corruption in a switch;
local/tander	• Loss of ringing feature on the terminating end;
exchange, internationa	• 85% of calls with dial tone delay of 3 seconds or more for 15 continuous minutes due to a loss
	of common of service encurs,
toll exchang	Loss of more energies can expanded (isotation) for te minutes of more, of
mobile	• Failure of more than 30% of the working BSC (or unit with equivalent function) of a mobile
switching centre)	network for 15 minutes or more
Cabling	• Damage of cabling facilities such as ducts and cables by road opening or other civil works
facilities	
IP telephony	• Failure of softswitch affecting 5 000 or more IP telephony end-users for more than 60 minutes;
services	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
L	

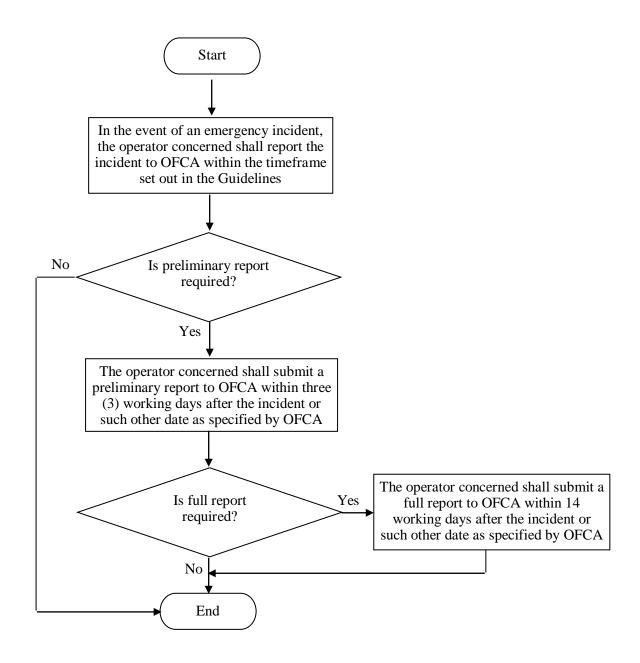
External	Submarine	•	Damage of submarine cable by ship anchor, fishing dredge, earthquake or other reasons; or
	Cable System	•	Multiple failures in the backhaul links leading to a loss of more than 50% of the backhaul
			capacity of a submarine cable system within Hong Kong
	Overland	•	Damage of overland cable by accident, vandalism, road opening, earthquake or other reasons;
	Cable System	•	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	•	Failure(s) in facilities of submarine cable system(s) or overland cable system(s) leading to a loss
	Network		of more than 50% of the total activated capacity between Hong Kong and another place;
	Facilities (other	•	Multiple failures in the backhaul links leading to a loss of more than 50% of backhaul capacity;
	than Submarine		or
	Cable System	•	Total failure in the main switch and standby switch
	and Overland		
	Cable System)		
Emergency In	ncident	•	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



Flowchart Showing the Main Steps for Reporting an Emergency Incident



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

Please submit this completed form to OFCA at \rtimes *.*

(a) Full name of the	
operator	
(b) Affected service(s)	
(c) Description of the	
incident	
(d) Date and time of onset	Date :// Time : :
of the incident	(dd/mm/yyyy)
(e) Types and estimated	
number of customers/end-	
users affected	
(f) Estimated number of	
injuries/deaths (for	
emergency incident only)	
(increasing mendent only)	
(g) Affected area(s)	
(6)	
(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 : _____