

**Guidelines for Cable-based External Fixed Telecommunications  
Network Services Operators and Internet Service Providers  
for Reporting Network and Service Outage**

**Office of the Communications Authority**

## Amendment History

<b>Item</b>	<b>Issue No.</b>	<b>Issue Date</b>	<b>Paragraph/Section</b>	<b>Description</b>
1	2	29.01.2008	Section C2	Revise the timeframe for reporting the Internet service outage
2	3	19.07.2011	Paragraph 1.5	Add Footnote 1 and renumber the original Footnote 1 in Issue 2 as Footnote 2
3	3	19.07.2011	Footnote 2	Add the meaning of overland cable system operators
4	3	19.07.2011	Paragraph 2.3	Add overland cable system outage and other editorial changes
5	3	19.07.2011	Paragraph 2.4	Editorial changes
6	3	19.07.2011	Appendix C	Editorial changes
7	3	19.07.2011	Appendices B, C and D	Add Appendix B and other editorial changes and rename the original Appendix B and Appendix C in Issue 2 as Appendix C and Appendix D respectively
8	4	01.10.2014	Whole document	(i) Editorial changes to rename OFTA to OFCA; (ii) add the requirement of notifications to affected customers.

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# **1 Introduction**

1.1 Public telecommunications networks and services form a critical part of the information infrastructure in Hong Kong. The information on public telecommunications network and service outage is essential to maintain and improve the infrastructure reliability as it provides the basis for the Office of the Communications Authority (“OFCA”) to determine whether the patterns of outage justify government interventions or industry cooperation initiatives to prevent the recurrence of similar outage. The critical need for timely and accurate information is also recognized in times of outage to assess their impacts and to determine whether immediate responses are required to contain or minimise the impacts.

1.2 Under their respective licences, public telecommunications operators are obliged to provide their services in a manner satisfactory to the Communications Authority (“CA”) at all times. To support CA’s functions and responsibilities in respect of overseeing the operators’ compliance with the licence condition, OFCA issues this document entitled “Guidelines for Cable-based External Fixed Telecommunications Network Services Operators and Internet Service Providers for Reporting Network and Service Outage” (“the Guidelines”).

1.3 The Guidelines should be observed by the cable-based external fixed telecommunications network services operators and Internet service providers (collectively called the “operators”). In the event of network or service outage, the operators should report the outage to OFCA in accordance with the criteria and timeframes set out in the Guidelines.

1.4 Both the operators and OFCA should play their respective roles in advising the users and the public. The operators, having the first-hand information about the operational status of their networks and services, should be responsible for providing prompt information and advice to their customers on outage or degradation. Where the outage or degradation falls within the reporting criteria, the operator concerned should, in addition to providing information and advice to its customers, report to OFCA within the specified timeframe. OFCA, upon receiving such information, should promptly inform the public and provide guidance where necessary if the outage or degradation is assessed to have significant and territory-wide implications.

1.5 The commercial sensitive information contained in the outage reports submitted by the operators should be treated as confidential and should not be disclosed without consent from the operators concerned <sup>1</sup>.

1.6 The Guidelines should be subject to continuous review to keep pace with the technological and market changes in order to safeguard the public interest.

## **2 Reportable Outage**

2.1 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 communication as a result of failure or degradation in the performance of an operator's network or service.

2.2 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.

2.3 The criteria for determining whether an outage event is reportable and the reporting procedures are given in Appendices A, B, C and D for submarine cable system outage, overland cable system outage, external telecommunications services ("ETS") outage and Internet service outage respectively. Submarine cable system operators, overland cable system operators <sup>2</sup>, cable-based external fixed telecommunications network services operators other than submarine cable system operators and overland cable system operators, and Internet service providers are required to comply with Appendices A, B, C and D respectively.

2.4 The reportable events given in the Appendices A, B, C and D are by no means exhaustive. Operators should, whenever necessary, report to OFCA

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<sup>1</sup> OFCA has made arrangements with its counterparts in other economies on information exchange relating to failures of submarine and overland cable systems. Such notification mechanisms will help secure early warnings and first hand information about the incidents that may adversely affect Hong Kong's public telecommunications services. The sensitive information exchanged will be treated as confidential and restricted for distribution on a strict need-to-know basis.

<sup>2</sup> For the purpose of the Guidelines, the term "submarine cable system operators" and "overland cable system operators" refer to the cable-based external fixed telecommunications network services operators who operate submarine cable systems and overland cable systems respectively.

on other events that may have significant impact on their network operation or services.

### **3 Information to be Provided by the Operator when Reporting an Outage**

3.1 When reporting an outage to OFCA, the operator concerned should provide OFCA with the following information, whenever possible :-

- (a) name of operator;
- (b) description of incident;
- (c) date and time of onset of the incident;
- (d) types and estimated number of customers/end-users affected;
- (e) affected areas;
- (f) actions taken; and
- (g) contact information: name of contact person as well as the person's fixed and mobile telephone numbers and email address.

### **4 Updates on Network and Service Status**

4.1 During the recovery stage, the operator concerned should 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.

### **5 Incident Report**

5.1 A preliminary report should be submitted to OFCA within 3 working days from the happening of the incident. The preliminary report should give a detailed account of the incident, the events which lead to the occurrence of the outage and the remedial actions taken.

5.2 Where requested by OFCA, a full report should be submitted to OFCA within 14 working days from the happening of the incident or other deadline as specified by OFCA. The full report should give a detailed account

of the measures which have been taken (or will be taken) in order to prevent similar incidents from happening again.

## **6 Contact Points**

6.1 OFCA's contact points for reporting outage are as follows :-

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6.2 Each operator is required to provide OFCA with the contact information of its focal point responsible for reporting outage to OFCA, including the names, fixed and mobile telephone numbers and email addresses of the first and second contact persons. Whenever there is any update on the contact information, the operator should inform OFCA of the change at least 5 days before the effective date.

## **7. Dissemination of Information to Customers by Internet Service Providers (ISPs)**

7.1 ISPs (including fixed and mobile network operators) providing internet access services (including fixed broadband and mobile data services) should endeavour to disseminate the outage information, in an expeditious and effective manner, to affected customers.

7.2 When communication channels are severely interrupted by the outage, the concerned ISP is encouraged to make a public announcement over mass media channels.

7.3 When the outage is restored, the concerned ISP should notify the affected customers within one hour after the affected network/service is restored.

**Submarine Cable System Outage**

The reporting criteria are given in Section A1. In the event of a submarine cable system outage, the submarine cable system operator should report the outage to OFCA within the timeframe set out in Section A2. Sections A3 and A4 show the examples of submarine cable system outage and the main steps for reporting the outage respectively.

**Section A1 Events of Submarine Cable System Outage**

	<b>Event</b>	<b>Duration of outage (minutes)</b>
Fishbone/linear submarine cable systems	Dual failures in two fishbone/linear submarine cable systems causing Hong Kong to be unable to communicate with other places by means of these two systems	> 30
Ring or other types of submarine cable systems	Failure in a ring or other type of submarine cable system causing Hong Kong to be unable to communicate with other places by means of that system	> 30
Backhauls	A loss of more than 50 % of the backhaul capacity of a submarine cable system within Hong Kong	> 30

**Section A2 Timeframe for Reporting Submarine Cable System Outage**

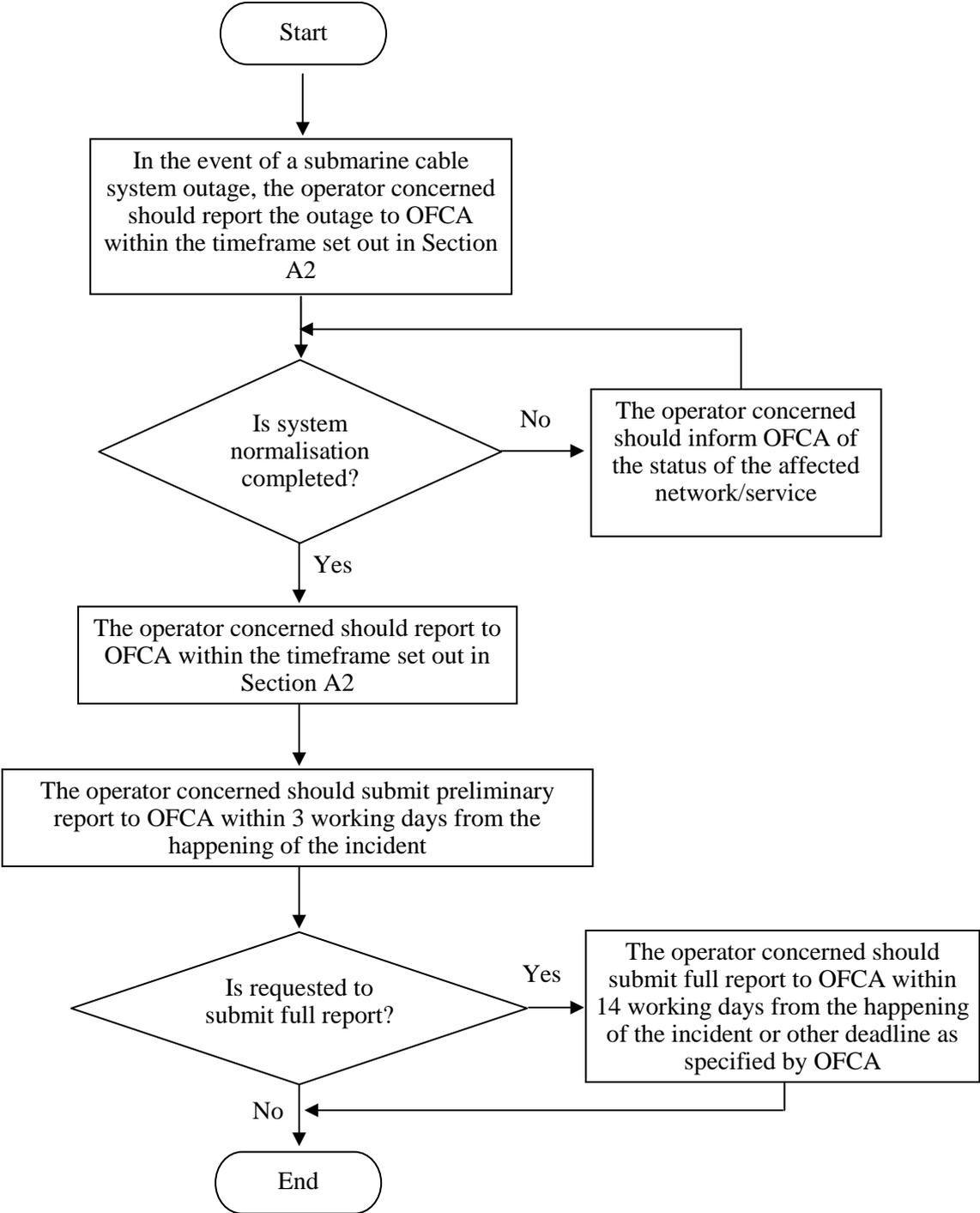
<b>Occurrence Time</b>	<b>Initial Report</b>	<b>System Normalization</b>
Between 00:00 and 24:00 of each day	The operator concerned should report the submarine cable system outage to OFCA within 2 hours from the confirmation of the outage or within 4 hours from the happening of the outage, whichever is earlier. Under critical circumstances, OFCA may request the operator concerned to submit the initial report within a shorter period of time.	The operator concerned should report to OFCA within 1 day from the completion of system normalization. Under critical circumstances, OFCA may request the operator concerned to report to OFCA within a shorter period of time.

**Section A3 Examples of Submarine Cable System Outage**

- ◆ Incidents of submarine cables such as submarine cables being damaged by anchors dropped from ships, dredging fishing nets, earthquakes or other unknown reasons.
- ◆ 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.

Note: The list above is by no means exhaustive. Operators should report other submarine cable system outage that is not covered in the list, if deemed necessary.

**Section A4 Flowchart Showing the Main Steps for Reporting Submarine Cable System Outage**



**Overland Cable System Outage**

The reporting criteria are given in Section B1. In the event of an overland cable system outage, the overland cable system operator should report the outage to OFCA within the timeframe set out in Section B2. Sections B3 and B4 show the examples of overland cable system outage and the main steps for reporting the outage respectively.

**Section B1 Events of Overland Cable System Outage**

	<b>Event</b>	<b>Duration of outage (minutes)</b>
Overland cable system	Failure in an overland cable system causing Hong Kong to be unable to communicate with Mainland China by means of that system	> 30
Overland cable capacity	A loss of more than 50 % of the total activated overland cable capacity between Hong Kong and Mainland China	> 30
Backhauls	A loss of more than 50 % of the backhaul capacity of an overland cable system within Hong Kong	> 30

**Section B2 Timeframe for Reporting Overland Cable System Outage**

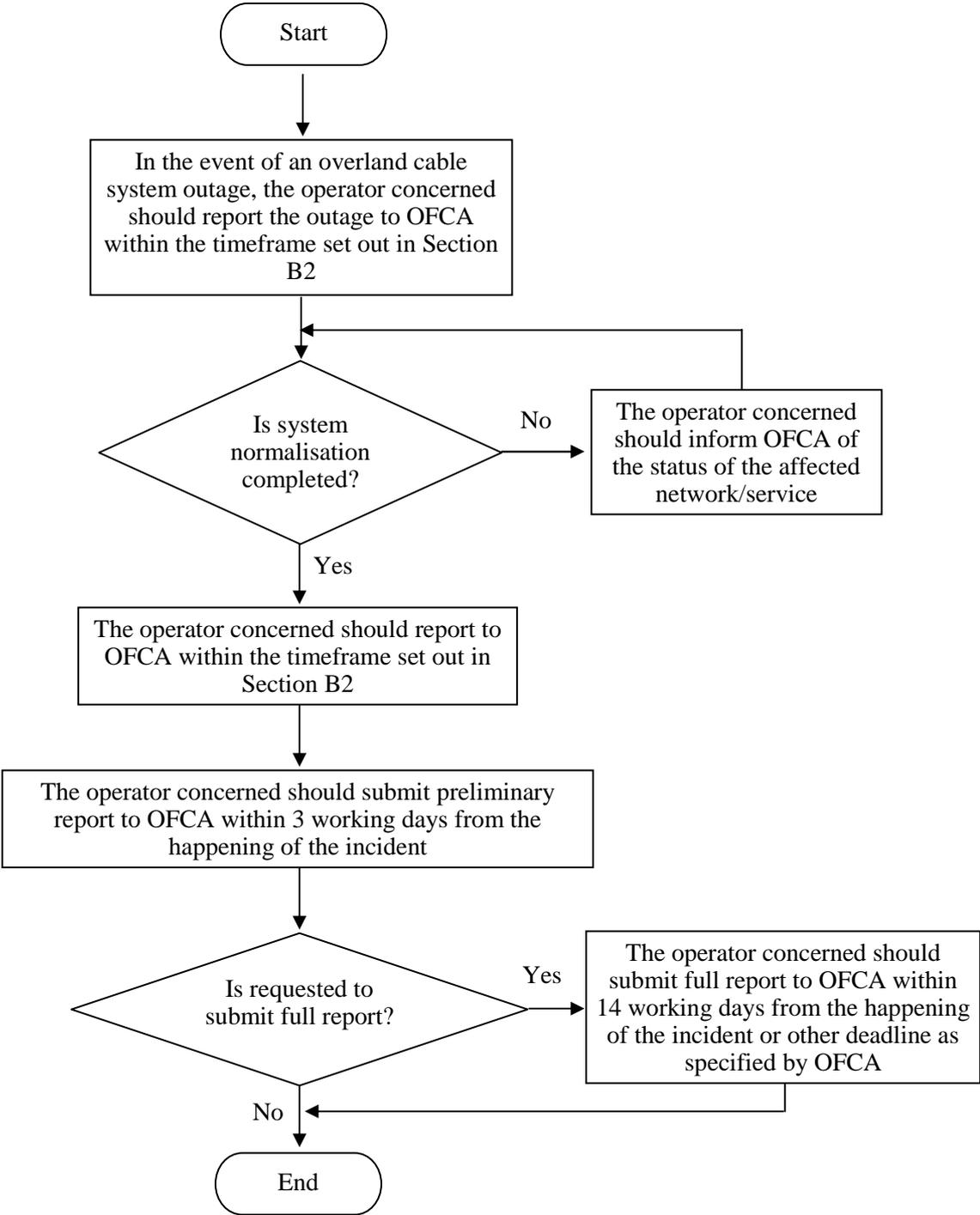
<b>Occurrence Time</b>	<b>Initial Report</b>	<b>System Normalization</b>
Between 00:00 and 24:00 of each day	The operator concerned should report the overland cable system outage to OFCA within 2 hours from the confirmation of the outage or within 4 hours from the happening of the outage, whichever is earlier. Under critical circumstances, OFCA may request the operator concerned to submit the initial report within a shorter period of time.	The operator concerned should report to OFCA within 1 day from the completion of system normalization. Under critical circumstances, OFCA may request the operator concerned to report to OFCA within a shorter period of time.

**Section B3 Examples of Overland Cable System Outage**

- ◆ Incidents of overland cables such as overland cables being damaged by accidents, vandalism, road opening, earthquakes or other unknown 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.
- ◆ 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.

Note: The list above is by no means exhaustive. Operators should report other overland cable system outage that is not covered in the list, if deemed necessary.

**Section B4 Flowchart Showing the Main Steps for Reporting Overland Cable System Outage**



**External Telecommunications Services Outage**

The reporting criteria are given in Section C1. In the event of an ETS outage, the cable-based external fixed telecommunications network services operator (other than submarine cable system operator and overland cable system operator) should report the outage to OFCA within the timeframe set out in Section C2. Sections C3 and C4 show the examples of ETS outage and the main steps for reporting the outage respectively.

**Section C1 Event of ETS Outage**

Event	Duration of outage (minutes)
A loss of more than 50% of the total activated capacity between Hong Kong and another place	> 30

**Section C2 Timeframe for Reporting ETS Outage**

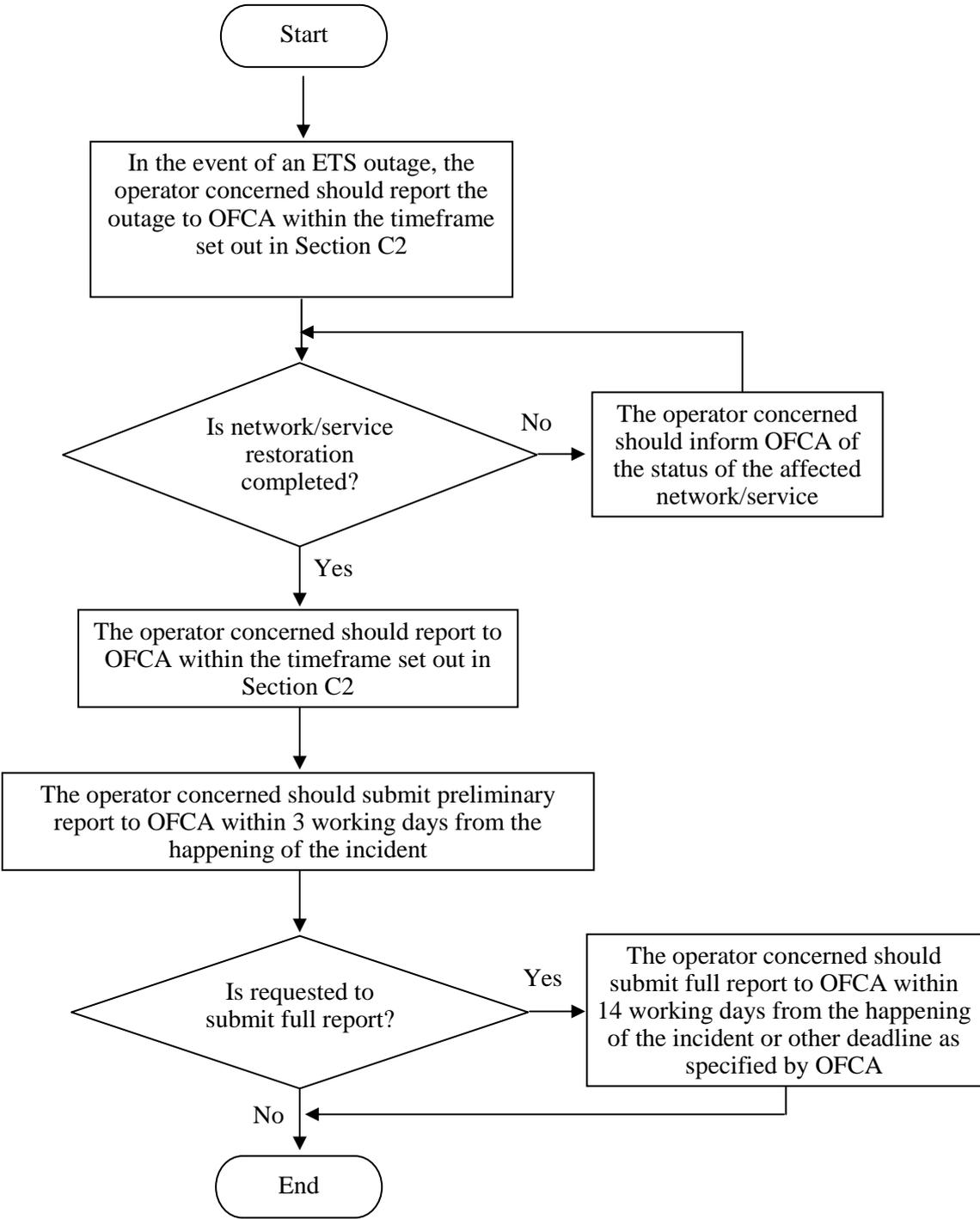
Occurrence Time	Initial Report	Restoration of Service
Between 00:00 and 24:00 of each day	The operator concerned should report the ETS outage to OFCA within 2 hours from the confirmation of the outage or within 4 hours from the happening of the outage, whichever is earlier. Under critical circumstances, OFCA may request the operator concerned to submit the initial report within a shorter period of time.	The operator concerned should report to OFCA within 1 day from the restoration of network/service. Under critical circumstances, OFCA may request the operator concerned to report to OFCA within a shorter period of time.

### **Section C3 Examples of ETS Outage**

- ♦ Failure(s) in 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.
- ♦ Total failure in the main switch and the standby switch.

Note: The list above is by no means exhaustive. Operators should report other ETS outage that is not covered in the list, if deemed necessary.

**Section C4 Flowchart Showing the Main Steps for Reporting ETS Outage**



**Internet Service Outage**

The reporting criteria are given in Section D1. In the event of an Internet service outage, the Internet service provider should report the outage to OFCA within the timeframe set out in Section D2. Sections D3 and D4 show the examples of Internet service outage and the main steps for reporting the outage to OFCA respectively.

**Section D1 Events of Internet Service Outage**

	<b>Event</b>	<b>Duration of outage (minutes)</b>
<b>External Connectivity</b>	A loss of 50 % or more of the total bandwidth to HKIX	> 30
	A loss of 50 % or more of the total bandwidth to local peers	> 30
	A loss of 50 % or more of the total bandwidth to any one of the following destinations :-  <ul style="list-style-type: none"> <li>• USA/North America</li> <li>• Mainland China</li> <li>• Asia Pacific countries</li> <li>• UK/Europe</li> </ul>	> 30
	Total bandwidth utilization to any one of the following destinations reaching or exceeding 95 % :-  <ul style="list-style-type: none"> <li>• HKIX</li> <li>• Local Peers</li> <li>• USA/North America</li> <li>• Mainland China</li> <li>• Asia Pacific countries</li> <li>• UK/Europe</li> </ul> Or	> 30

	<b>Event</b>	<b>Duration of outage (minutes)</b>
<b>External Connectivity</b>	<p>Total bandwidth utilization to any one of the following destinations dropping to 50 % or below (with reference to the date/time of the previous week) :-</p> <ul style="list-style-type: none"> <li>• HKIX</li> <li>• Local Peers</li> <li>• USA/North America</li> <li>• Mainland China</li> <li>• Asia Pacific countries</li> <li>• UK/Europe</li> </ul>	> 30
<b>Core Network</b>	Degradation of service or failure of critical components including, but not limited to, DNS, routers or switches that would affect/potentially affect 10,000 or more users	> 30
<b>User Connectivity</b>	Degradation of service or failure of critical components including, but not limited to, DHCP, or authentication servers that would affect 10,000 or more users	> 45

**Section D2 Timeframe for Reporting Internet Service Outage**

<b>Occurrence Time</b>	<b>Initial Report</b>	<b>Restoration of Service</b>
Time Zone 1 (Between 08:30 and 01:00 of next day)	The operator concerned should report the Internet service outage to OFCA within 1 hour from the happening of the outage	The operator concerned should report to OFCA within 2 hours from the restoration of the network/service
Time Zone 2 (Between 01:00 and 08:30)	The operator concerned should report the Internet service outage to OFCA within 1 hour from the happening of the outage or by 08:30, whichever is later	The operator concerned should report to OFCA within 2 hours from the restoration of the network/service or by 08:30, whichever is later

### **Section D3 Examples of Internet Service Outage**

- ♦ A loss of 50 % or more of the total connection bandwidth to HKIX.
- ♦ A loss of 50 % or more of the total bandwidth to any one of the following destinations :-
  - Mainland China
  - US
  - UK/Europe
  - Asia Pacific countries.
- ♦ 95 % or more of the total bandwidth utilization of connections to HKIX is constantly reached for 30 minutes.
- ♦ 10,000 or more users are unable to connect to the Internet.
- ♦ Failure of core routers/switches causing 10,000 or more users to be unable to access to the Internet.

Note: The list above is by no means exhaustive. Operators should report other Internet service outage that is not covered in the list, if deemed necessary.

**Section D4 Flowchart Showing the Main Steps for Reporting Internet Service Outage**

