

**FINAL DECISION OF  
THE COMMUNICATIONS AUTHORITY**

**DISRUPTION OF THE TELECOMMUNICATIONS SERVICES OF  
SMARTONE MOBILE COMMUNICATIONS LIMITED AND  
SMARTONE COMMUNICATIONS LIMITED**

<b>Telecommunications Licensee Investigated:</b>	SmarTone Mobile Communications Limited and SmarTone Communications Limited (collectively “SmarTone”)
<b>Issue:</b>	There was a disruption of the telecommunications services of SmarTone on 18 March 2013
<b>Relevant Instruments:</b>	General Condition (“GC”) 5.1 of SmarTone’s Fixed Carrier Licence (“FCL”) No. 007 and Unified Carrier Licence (“UCL”) No. 018
<b>Decision:</b>	No breach of GC 5.1 of SmarTone’s FCL No. 007 and UCL No. 018
<b>Sanction:</b>	N/A
<b>Case Reference:</b>	LM T 18/3 in OFCA/R/R/134/2 C

**BACKGROUND**

At around 10:31 am on 18 March 2013, SmarTone reported to the Office of the Communications Authority (“OFCA”) that there was a software problem in its fixed number portability (“FNP”) platform which affected the outgoing voice traffic from its customers to all fixed networks, including SmarTone’s own fixed network. OFCA activated the Emergency Response System<sup>1</sup> and kept in close contact with SmarTone to monitor the situation.

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<sup>1</sup> Emergency Reporting System is the communication arrangement for maintaining contacts among OFCA and all the major public telecommunications network service operators when there is a risk of possible network congestion problem or network outage which may affect the general public.

## **THE SERVICE DISRUPTION**

2. According to SmarTone, at 10:17 am on 18 March 2013, its network operations centre (“NOC”) observed that the FNP platform was not in operation. The FNP platform is responsible for providing call routing information for outgoing voice calls from SmarTone’s networks to all fixed networks, including SmarTone’s own fixed network. Because of the malfunction of the FNP platform, SmarTone’s fixed network and mobile network failed to convey outgoing voice calls to all fixed networks during the period from 10:17 am to 11:15 am on 18 March 2013. The incident affected around 40 000 customers of SmarTone, representing about 2.8% of its active customer base. SmarTone emphasized that, during the outage period, short message services (“SMS”), data services, incoming voice service from fixed networks, outgoing/incoming voice service to/from mobile networks and emergency service remained normal.

3. SmarTone claimed that, after it had confirmed that the FNP platform was not in operation, it immediately implemented the bypass procedures and routed all affected traffic under an interim call routing arrangement to its partner fixed network operators (which routed the traffic to the terminating fixed networks on behalf of SmarTone). According to SmarTone, the affected services resumed normal from 11:15 am, after the completion of the bypass process.

## **OFCA’S INVESTIGATION**

4. OFCA has conducted an investigation into the incident, to –
- (a) examine whether SmarTone had breached GC 5.1 of its FCL No. 007 and UCL No. 018, which specifies that –

*“5.1 The licensee shall, subject to Schedule 1 to this licence and any special conditions of this licence relating to the provision of the service, at all times during the validity period of this licence operate, maintain and provide a good, efficient and continuous service in a manner satisfactory to the Authority... ”; and*

- (b) review the responses of SmarTone to the incident (including the communication with OFCA, customers and the media, and the efficiency of service restoration etc.) to examine whether there are any areas requiring SmarTone to make improvements.

5. In the course of OFCA's investigation, SmarTone has submitted to OFCA a preliminary report<sup>2</sup> on 20 March 2013 and a full report<sup>3</sup> on 10 April 2013 in accordance with the "Guidelines for Fixed and Mobile Network Operators for Reporting Network Outage" issued on 17 June 2008 (the "Guidelines"). OFCA has carefully examined the two reports. As part of the investigation, OFCA has also examined the four consumer complaints it received concerning the incident. The complaints were mainly about customers' dissatisfaction of the service disruption and the difficulties in reaching SmarTone's customer hotline during the disruption period. OFCA has not received any complaint from the media against SmarTone regarding the incident.

6. OFCA completed its investigation and submitted its findings to the Communications Authority ("CA") on 6 July 2013. Having considered the findings of OFCA, the CA issued its Provisional Decision to SmarTone on 8 July 2013 and invited SmarTone to make representations within 14 days. SmarTone submitted to OFCA on 26 July 2013 that it supported the CA's Provisional Decision.

## **Issues Examined During the Investigation**

### The Cause of the Incident and the Adequacy of SmarTone's Preventive Measures

7. According to SmarTone, the incident was caused by a software bug in the FNP platform. The problematic software held up the memory resources of the FNP platform rendering it unable to respond to requests for routing information made by switching equipment. As a result, the switching equipment could not convey outgoing voice calls from SmarTone's

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<sup>2</sup> The preliminary report of SmarTone may be downloaded from OFCA's website at [http://www.ofca.gov.hk/filemanager/ofca/en/content\\_723/smartone\\_report\\_20130318.pdf](http://www.ofca.gov.hk/filemanager/ofca/en/content_723/smartone_report_20130318.pdf).

<sup>3</sup> The full report of SmarTone may be downloaded from OFCA's website at [http://www.ofca.gov.hk/filemanager/ofca/en/content\\_723/smartone\\_report\\_20130318full.pdf](http://www.ofca.gov.hk/filemanager/ofca/en/content_723/smartone_report_20130318full.pdf).

networks to all fixed networks during the period from 10:17 am to 11:15 am on 18 March 2013. As the FNP platform was only responsible for providing routing information for outgoing voice calls to fixed networks, other services of SmarTone including SMS, data services, incoming voice service from fixed networks, outgoing/incoming voice service to/from mobile networks and emergency service were not affected.

8. SmarTone reported that the FNP platform was supplied by Syniverse Technologies LLC (“Syniverse”), a reputable telecommunications equipment vendor.<sup>4</sup> The FNP platform has been in service since June 2007. Before the FNP platform was put into service, SmarTone had conducted full functional test and system acceptance test to verify its stability and confirmed that it was compatible with SmarTone’s networks. SmarTone also said that it had endeavoured to ensure the stability and reliability of the FNP platform after it had been put into service. SmarTone had regular maintenance and health checking arrangements for the FNP platform, and software upgrade and patches application for the FNP platform were performed closely following the vendor’s recommendation. The most recent software upgrade for the FNP platform was carried out on 7 March 2013.

9. SmarTone emphasized that, according to Syniverse, the software bug discovered in this incident had never been found in Hong Kong or any where else in the world before. Such kind of problem would only arise under special circumstances when there was sustained high traffic loading over a long period of time.

10. To prevent similar incident from recurring again in future, SmarTone submitted that Syniverse would –

- (a) immediately review and audit all systems with similar design thoroughly;<sup>5</sup> and
- (b) implement a new alarm mechanism to strengthen the detection of resource hanging problem in the FNP platform.

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<sup>4</sup> Syniverse is the founding associate member of the GSM Association. According to Syniverse, more than 900 mobile operators, cable and Internet providers, and enterprises in over 160 countries are its clients.

<sup>5</sup> SmarTone informed us on 30 April 2013 that Syniverse had completed the audit and confirmed that all systems were in healthy status.

## *OFCA's Assessment*

11. OFCA recognizes that it is not uncommon for software bugs to exist in a computer programme. As a user of the FNP platform supplied by Syniverse, OFCA considers that SmarTone has acted reasonably to ensure that the FNP platform had been fully tested before it was put into service. Besides, SmarTone has strived to ensure the software of the FNP platform is up-to-date and there are also regular maintenance and health checking procedures in place to ensure the proper functioning of the FNP platform (the most recent software upgrade for the FNP platform was carried out on 7 March 2013 and the last routine checking of the FNP platform was carried out in February 2013). As the FNP platform (including hardware and software) was supplied by Syniverse and SmarTone is just a user of it, OFCA considers that the service disruption was caused by circumstances beyond SmarTone's control.

12. To safeguard against the outage of FNP platform, OFCA notes that SmarTone has made provision for diversity arrangements and backup plan in the network design. SmarTone has three FNP nodes in operation in three different switching centres. Each of these FNP nodes is equipped with full capacity so that, in case any one of them malfunctions, the other two FNP nodes can share the work of the failed one. In the current incident, the diversity arrangement did not function because the software bug affected all three FNP nodes and none of them was operational during the incident. Apart from the diversity arrangement, SmarTone has also made provision for backup arrangement to bypass the FNP platform in case of emergency. When there is a complete outage of FNP platform (such as the current incident), SmarTone may route the affected traffic to its partner fixed network operators which would deliver the traffic to the destination on behalf of SmarTone. The bypass arrangement was implemented in the current incident and had effectively helped SmarTone restore the services within a short period of time.

13. In conclusion, having examined the cause of the incident and the preventive measures taken by SmarTone, OFCA accepts that the outage of the FNP platform was due to circumstances beyond SmarTone's control. OFCA is also satisfied that SmarTone has taken reasonable preventive measures to ensure the proper operation of its FNP platform.

## Time and Actions Taken by SmarTone to Restore Services

14. SmarTone submitted that, as soon as its NOC had observed that the FNP platform malfunctioned at 10:17 am on 18 March 2013, its engineers (and Syniverse) had worked closely to resolve the problem. They had attempted to restore the FNP platform but to no avail. The FNP platform still could not take up traffic as normal.

15. Once the attempt to restore the FNP platform had proven unsuccessful, SmarTone immediately activated the backup arrangement to bypass the FNP platform. The implementation of the bypassing arrangement was completed at around 11:15 am on 18 March 2013, and SmarTone's outgoing voice services to fixed networks had resumed normal since then.

16. According to a subsequent update from SmarTone, a new software patch was developed by Syniverse to resolve the resource hanging issue on 26 March 2013 (i.e. eight days after the incident). After going through the verification and stress tests, all FNP nodes have been equipped with the new software patch. The FNP platform has been put back into service and the bypass arrangement has been deactivated from 28 March 2013.

### *OFCA's Assessment*

17. OFCA notes that, once SmarTone was alerted to the malfunction of the FNP platform, it had escalated the matter to Syniverse, its vendor, in the first instance and had been working closely with Syniverse to resolve the problem. OFCA also notes that SmarTone had attempted to restore the FNP platform. Once the restoration was found unsuccessful, SmarTone had taken a decisive move to bypass the FNP platform and had managed to complete the bypass process within a short timeframe. The total duration of the service disruption was around 58 minutes. OFCA notes that SmarTone was able to complete the bypass process within a short period of time because it had put in place in advance the backup arrangement, which had enabled SmarTone to effectively shorten the service restoration time and minimize the impacts on customers.

18. Overall speaking, OFCA considers that SmarTone had put in place emergency plan to cater for the failure of FNP platform and the time and actions taken by SmarTone to restore the services are acceptable.

#### SmarTone's Communication with OFCA over the Service Disruption

19. According to the Guidelines, a network operator should report to OFCA in the event of network outage. The Guidelines also specify that the failure of a gateway number database (i.e. the database of the FNP platform) persisting for longer than 15 minutes is considered a critical network outage. If the outage occurs on weekdays during the period from 7:30 am to 9:00 pm, the network operator concerned should report the outage to OFCA within 15 minutes after the triggering criteria for reporting the outage are met.

20. The malfunction of SmarTone's FNP platform occurred from 10:17 am to 11:15 am on 18 March 2013 (a weekday). Pursuant to the Guidelines, SmarTone should notify OFCA about the incident by 10:47 am. According to OFCA's records, SmarTone notified OFCA of the incident at 10:31 am. After the affected services resumed normal at 11:15 am, SmarTone informed OFCA at 11:22 am.

#### *OFCA's Assessment*

21. OFCA notes that SmarTone had notified OFCA of the incident within the timeframe stipulated in the Guidelines and kept OFCA updated of the progress of its restoration works from time to time during the period of service disruption. As SmarTone had complied with the requirements stipulated in the Guidelines and had been cooperative and responsive to OFCA's enquiries about the service disruption, OFCA considers that the manner in which SmarTone handled its communication with OFCA throughout the period of service disruption is satisfactory.

#### SmarTone's Communication with Customers and the Media

22. According to SmarTone, it notified customers of the incident through the following channels on 18 March 2013 –

- (a) once it became aware of the service disruption, SmarTone

immediately notified its frontline staff (i.e. including the retail staff and the hotline staff) of the details of the incident to enable them to answer customer inquiries with updated information;

- (b) at 10:56 am, SmarTone posted a message on its customer service page on the Facebook to notify customers of the service disruption;
- (c) at 10:57 am, SmarTone posted a notification at its website. A message was also sent to the media by email informing them of the service disruption; and
- (d) at 11:31 am, SmarTone posted an updated notification on the Facebook and its website notifying the customers and the public that the affected services had resumed normal. In parallel, a similar notification was also sent by email to the media.

#### *OFCA's Assessment*

23. OFCA notes that SmarTone had notified its customers and the media of the service disruption timely. The notification was made to the public through posting a message on its customer service page on the Facebook and at its website around 40 minutes after the service disruption occurred. An email was also sent to the media regarding the service disruption around the same time.

24. After the affected services resumed normal, SmarTone had also provided its customers and the media with an updated notification within a reasonable timeframe. OFCA considers that the arrangement made by SmarTone in notifying its customers and the media of the service disruption satisfactory.

25. Having said, OFCA has received a complaint about the difficulties in reaching SmarTone's customer hotline during the period of service disruption. SmarTone has been requested to look into the matter to see whether anything needs to be done in response to the complaint.



## **THE CA'S CONSIDERATION AND DECISION**

26. After examining the facts of the case, the findings of OFCA and the representations of SmarTone, the CA considers that SmarTone has –

- (a) taken reasonable preventive measures to ensure the proper operation of the FNP platform and formulated in advance a backup arrangement which could be triggered readily in case there is outage of FNP platform. The service disruption was caused by circumstances beyond the control of SmarTone;
- (b) taken expeditious actions to identify the cause of the problem and has restored the affected service within an acceptable timeframe;
- (c) reported the service disruption to OFCA within the timeframe stipulated in the Guidelines and cooperated with OFCA during the service disruption period; and
- (d) notified its customers and the media of the service disruption within an acceptable timeframe.

27. In conclusion, the CA considers that SmarTone has not breached GC 5.1 of its licences, which requires it to provide a good, efficient and continuous service in a manner satisfactory to the CA.

**The Communications Authority**  
**September 2013**