

Case Reference	R/E/I/117
Title	M1's Service Difficulty Incident on 4 February 2014 (" Service Difficulty Incident ")
Case Opened	4 February 2014
Case Closed	15 December 2014
Complainant	IDA initiated this proceeding pursuant to the Code of Practice for Telecommunication Service Resiliency (" Service Resiliency Code ")
Respondent	M1 Limited (" M1 ")
Case Summary	<p>The Service Difficulty Incident occurred around 0700hrs on 4 February 2014. 2G and 3G voice and SMS, and 2G, 3G and 4G data services being served via one of the Operations Centres ("OCs") were affected intermittently. The impact was not location specific. The affected services were fully restored on 4 February 2014 at 1215hrs.</p> <p>Based on IDA's investigation, the Service Difficulty Incident was due to a pair of mobile site switches¹, which was between the Home Location Register² ("HLR") and Mobile Switching Centre³ ("MSC"). An unknown call processing software error caused the message packets to loop within the pair of mobile site switches, resulting in intermittent connection problem between the switches and customer databases. This prevented M1 subscribers from being authenticated on its network. The unsuccessful authentication attempts also tied up network resources which led to congestion at the network layer.</p> <p>M1 re-initialised the mobile site switches and restored the service.</p> <p>Following the Service Difficulty Incident, to better manage sudden and unexpected extreme traffic conditions, M1 deployed a software enhancement in its Media Gateway⁴ layer in March 2014.</p>

¹ Mobile site switches are aggregated ports serving as an interconnection between HLR and MSC server.

² The HLR is the main database of permanent subscriber information for a mobile network.

³ The MSC is mostly associated with communications switching functions, such as call set-up, release, and routing. It also performs a host of other duties, including routing SMS messages, conference calls, fax, and service billing as well as interfacing with other networks, such as the public switched telephone network (PSTN).

⁴ Media Gateway translates and converts digital media streams between disparate networks. Each of M1's active RNCs associates with one dedicated Media Gateway.

<p>IDA's Determination</p>	<p>M1 would be in breach of the Service Resiliency Code for any service difficulty that exceeds duration of one hour and affects an aggregate of 5% or more of its base stations. As services served via one of its OCs were affected, this would mean that more than half of M1's base stations were affected. It would not be a breach of the Service Resiliency Code if M1 can establish to the satisfaction of IDA that the occurrence of the Service Difficulty Incident was not within its control and occasioned through no fault on its part.</p> <p><u><i>Exception to Breaches of the Service Resiliency Code</i></u></p> <p>IDA notes that the Service Difficulty Incident was due to an unknown software bug in the mobile site switches which M1 and its vendor had not previously encountered. An unusually high CPU utilisation was observed during the Service Difficulty Incident. M1 re-initialised the mobile site switches and restored the service. IDA also notes that this Service Difficulty Incident occurred during the period where no network upgrade/change had been carried out.</p> <p>IDA found that M1 had proceeded to restore service in an expeditious manner by activating its vendors promptly and undertaking the relevant troubleshooting measures. Hence, and there was no undue delay by M1 during the service restoration process.</p> <p>In view of the above, IDA concluded that M1 has not breached the Service Resiliency Code and the occurrence of the Service Difficulty Incident, which was triggered by a software bug in the mobile site switches, was not within M1's control. IDA also found that there was no undue delay in M1's service recovery. Taking into consideration the above, it is assessed that M1 has not contravened the Service Resiliency Code for the Service Difficulty Incident as M1 has established the exception under the Service Resiliency Code.</p> <p>IDA notes that in times of service difficulty, service restoration would be the priority especially when critical network elements are affected. Should a decision be taken to re-initiate network elements in order to restore services, log files may be deleted which would make further problem diagnosis more difficult. Service providers are advised to exercise reasonable judgement on when to re-initiate network elements and take measures to preserve log files, such as creating backups for the log files before re-initialising network equipment, to the extent possible to allow further diagnosis of the root cause of any service difficulty.</p>
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