Case Reference	R/E/I/116
Title	M1’s Service Difficulty Incident on 16 October 2013 (“**Service Difficulty Incident**”)
Case Opened	16 October 2013
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	The Service Difficulty Incident occurred around 0300hrs on 16 October 2013, after M1 upgraded its Radio Network Controller[1] (“**RNC**”) at its Jurong Main Operation Centre (“**MOC**”). It affected more than 300 2G and 300 3G base stations, which is an aggregate of more than 5% of M1’s base stations. 2G and 3G voice and data services as well as SMS were affected intermittently during the Service Difficulty Incident. It was estimated that about 23,000 subscribers in Ang Mo Kio, Choa Chu Kang, Jurong, Yishun and Woodlands might have been impacted. The affected services were fully restored on 16 October 2013 at 0915hrs. Based on IDA’s investigations, the Service Difficulty Incident was due to a software glitch in the Media Gateway[2] (“**MGW**”) which was associated with the upgraded RNC. During the software upgrade, the aforesaid RNC was disconnected from its associated MGW in order to load the new software. When the software upgrade was completed, the links between the RNC and the MGW were re-established. This created an increase in signalling traffic towards the MGW and subsequently caused an overload to message queue, which triggered a previously unknown software glitch on the MGW. As a result of the glitch, a memory allocation error occurred in the MGW processing module. IDA was informed that prior to the Service Difficulty Incident, a similar upgrade was executed successfully on another RNC at M1’s MOC without any service disruption. Following the Service Difficulty Incident, all works pertaining to M1’s planned network upgrade for its RNCs were suspended until M1 had a solution to the problem. M1 developed a software patch for the MGWs to resolve the memory allocation issue. This software patch for the MGWs was made available on 30 October 2013. Following a comprehensive testing and verification, the

[1] RNC is responsible for managing the 3G radio access network and radio channels.

[2] MGW translates and converts digital media streams between disparate networks. Each of M1’s active RNCs associates with one dedicated MGW.

	software patch for the MGWs was successfully loaded to all MGWs in M1's network on 12 November 2013.
IDA's Determination	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. 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. *<u>Exception to Breaches of the Service Resiliency Code</u>* IDA notes that the same software package (loaded to the RNC on 16 October 2013) was in fact successfully loaded on another RNC in September 2013 without any service disruption, and that M1's MGW vendor had not encountered such software glitch on the MGW prior to the Service Difficulty Incident. M1 also clarified that all systems and software underwent thorough and extensive testing including interoperability and compatibility testing in the testbed environment on an end-to-end connectivity basis before they were loaded to the network. IDA has found that M1 has not breached the Service Resiliency Code. It was assessed that M1 had taken all reasonable measures to test the RNC software upgrade before implementing it to its network. It was also assessed that that there was no undue delay in relation to M1's service restoration. Taking into consideration the above, IDA's conclusion is 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.