



**MALAYSIAN COMMUNICATIONS AND MULTIMEDIA COMMISSION**

**A REPORT ON A PUBLIC INQUIRY UNDER THE MANDATORY  
STANDARD FOR THE INTERNATIONAL MOBILE  
TELECOMMUNICATIONS 2000 (IMT-2000) SYSTEM IN MALAYSIA**

**(15 JULY 2002)**

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**GLOSSARY**

Act	The Communications and Multimedia Act 1998
AMPS	Advanced Mobile Phone System
CDMA	Code Division Multiplexing Access
Commission	The Malaysian Communications and Multimedia Commission
ETACS	Enhanced Total Access Communications System
GGSN	Gateway GPRS Support Node
GPRS	General Packet Radio Services
GSM	Global System for Mobile Communications
IMT 2000	International Mobile Telecommunications 2000
ITU	International Telecommunication Union
NMT	Nordic Mobile Telephone
PCU	Packet Control Unit
SGSN	Serving GPRS Support Node
TDMA	Time Division Multiplexing Access
WG6	Working Group 6

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## **SECTION ONE : INTRODUCTION**

### **1.1 Introduction**

1.1.1 On 11 December 2001, the Minister directed the Commission to determine the standards on IMT-2000 terrestrial component (Direction No. 5 of 2001, 'Ministerial Direction on the Standards on International Mobile Telecommunications 2000 Terrestrial Component,' or "*the Direction*")

1.1.2 According to the Minister's direction, the mandatory standard for IMT-2000 terrestrial component should be:

- (i) Based on IMT-2000 Code Division Multiple Access Direct Spread and IMT 2000 Code Division Multiple Access Time Division Duplex;
- (ii) On specifications of the mandatory standards, reference to be made to 3GPP documents from 1 series, 3 series, 4 series, 5 series, 8 series and 21 series until 35 series

### **1.2 Public Inquiry**

1.2.1 The Commission embarked on a public inquiry on 2 May 2002 and released a Public Inquiry Paper on the Proposal for the Determination of Mandatory Standards for IMT-2000 as part of the inquiry process. The paper contained:

- (a) A preface
- (b) The proposed IMT-2000 framework and
- (c) Questions forwarded for commenting purposes

1.2.2 The deadline for submissions was 12noon, 15 June 2002. At the close of inquiry the Commission had received eleven submissions. Please refer to Annexure A of this report, which carries the detailed comments. A summary of the comments /suggestions are contained in Section 8 of this Report, entitled "Findings".

1.2.3 This Report captures the conclusions above and makes reference to the Commission's proposed IMT-2000 standard in the following manner:

SECTION TWO sets out the legal context for a determination by the Commission of a mandatory standard on IMT-2000 under the Communications and Multimedia Act 1998.

SECTION THREE provides the background on the mobile communications standards in Malaysia.

SECTION FOUR sets out the IMT-2000 system and standards available.

SECTION FIVE sets out the proposal and study of Working Group 6 (WG6).

SECTION SIX sets out the public inquiry process for the report.

SECTION SEVEN details out the findings of the public response for the Malaysian Standard on IMT-2000.

**SECTION EIGHT highlights the way forward.**

**SECTION TWO: LEGAL CONTEXT FOR A DETERMINATION BY THE  
COMMISSION THE STANDARDS ON IMT-2000 UNDER  
THE COMMUNICATIONS AND MULTIMEDIA ACT 1998**

- 2.1 On 11 December 2001, the Minister of Energy, Communications and Multimedia had, under Sections 7 of the Act, directed the Commission to determine the standards on IMT 2000 Terrestrial Component. Section 7(1) of the Act states that:  
*“The Minister may, from time to time, issue directions to the Commission on the exercise of the Commission’s powers and the performance of the Commission’s functions and duties under this Act, whether of a general character or otherwise.”*
- 2.2 With regard to determining a standard, the Commission is acting under the Direction specified above, to carry out its duties to determine such standard under Section 104(2) of the Act, which states that:  
*“The Commission shall determine a mandatory standard if it is subject to a direction from the Minister to determine a mandatory standard in place of a voluntary industry code”.*
- 2.3 As such, the matter of mandating the standard for IMT2000 terrestrial component falls under the Commission’s power to determine, as provided for in Section 55(1). Section 55(1) states that “[t]he Commission may, from time to time, determine any matter specified in this Act as being subject to the Commission’s determination.”
- 2.4 In carrying out its powers to determine, Section 55(3) further states that, “[n]otwithstanding subsection (1), the Commission shall not conduct an inquiry unless it is satisfied that the matter is of significant interest to either the public or to current or prospective licensees under this Act.”
- 2.5 Under the powers and functions provided for by the Act, the Commission is hereby holding a public inquiry to determine a mandatory standard for IMT-2000 Terrestrial Component in Malaysia.

**SECTION THREE : BACKGROUND ON MOBILE COMMUNICATIONS  
STANDARDS IN MALAYSIA**

- 3.1 The First Generation mobile phone services started its commercial service in Malaysia with the introduction of the ATUR 450 (Automatic Telephone Using Radio) to the general public. This analogue service is based on the NMT 450 (Nordic Mobile Telephone) technology and has been designed to cater for voice only. In the late eighties, the ART 900 mobile phone service was introduced, which also uses analog technology, namely the ETACS (Enhanced Total Access Communications System). Thereafter another analog mobile service, which was the Mobifon800, based on the AMPS (Advanced Mobile Phone Service) technology was introduced. The First Generation mobile phone services were based on analog system that could cater to only (limited) voice service.
- 3.2 The introduction of GSM (Global System for Mobile Communication) in the early nineties marked the migration from analog system to the digital system. The GSM system was designed to cater for voice and data services at a rate of 9.6kbps. Another digital telephony service that was also introduced within the same time frame was the DAMPS (Digital AMPS) system. Both these technologies were considered as the 2<sup>nd</sup> Generation of Mobile Telephony Services.
- 3.3 With the immense demand for Internet services, a more enhanced mobile telephony service utilizing the latest technology is required. GPRS (General Packet Radio Services) was introduced to overcome this situation. GPRS is seen to be as an overlay network on top of the GSM network with added components such as the PCU (Packet Control Unit), SGSN (Serving GPRS Support Node) and the GGSN (Gateway GPRS Support Node). The GPRS is capable of handling data transmission up to 115kbps.
- 3.4 The Internet development and demand towards multimedia services through the Internet as well as the mobile system is causing international communication society to think of a technology that can provide solution to this demand. The 3<sup>rd</sup> generation mobile system is preferred as the key solution to these requirements. The basic criteria for the 3<sup>rd</sup> Generation technology was determined through working group meetings which was set up by a consortium of standard institutes in the USA, Europe, Asia, ITU as well as equipment manufacturers. Based on standard criteria, technology producers are put forward to design and develop the 3<sup>rd</sup> generation system technology. This initial design for the 3<sup>rd</sup> Generation technology becomes the benchmark to evaluate, develop and refine the standard. The capability of the technology is further refined such that it can be accepted and appropriate to be commercialized.
- 3.5 Among the important criteria of the 3<sup>rd</sup> Generation system is the ability to handle data delivering at a maximum speed of 384 Kbps while moving and 2 Mbps stationary. The emphasis given towards designing the 3<sup>rd</sup> Generation technology is that its will become the 'evolutionary technology' from the current existing system such as GSM-MAP, TDMA (ANSI-136) and CDMA (IS-95). The design is hoped to become the 3<sup>rd</sup> Generation technology that capable to exploit the core network of the existing 2<sup>nd</sup> Generation system by doing minimum modification to the radio interface components.

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- 3.6 Consideration towards the design technology is done based on the stipulated standard criteria that has been refined and determined earlier. As a result, the international community through ITU has mutually agreed on five technologies that can be used and adapted to appropriate the need of the current network. Following this effort, the 3<sup>rd</sup> Generation mobile telephone system has been formally named by the ITU as the IMT-2000 system by using the above standard that has been determined.



**SECTION FOUR : THE IMT-2000 SYSTEM AND STANDARDS  
AVAILABLE**

- 4.1 Five technologies have been developed for the 3<sup>rd</sup> Generation mobile telephone system. The technologies are: -
- (i) IMT-2000 CDMA Direct Spread;
  - (ii) IMT-2000 CDMA Multi Carrier;
  - (iii) IMT-2000 CDMA TDD;
  - (iv) IMT-2000 CDMA Single Carrier; and
  - (v) IMT-2000 FDMA/TDMA.
- 4.2 Both CDMA Direct Spread and CDMA TDD are identified as Wideband CDMA or W-CDMA, and these two standards were developed by 3GPP (3<sup>rd</sup> Generation Partnership Program), a consortium consisting of organizations developing standards. Member countries that play active role in 3GPP among others are European countries, Japan and China. This technology was designed based on GSM-MAP (Mobile Application Part) system as the core network. Any company that currently offers mobile telephone services using the 2<sup>nd</sup> Generation GSM system upgraded to GPRS is capable of migrating to 3<sup>rd</sup> Generation service through the GSM-MAP path.
- 4.3 On the other hand, CDMA Multi Carrier, also known as CDMA 2000 was developed by 3GPP2 (3<sup>rd</sup> Generation Partnership Program 2). 3GPP2 is also a consortium consisting of organizations that develop standards similar to 3GPP. Member countries that play an important role in 3GPP2 are such as the USA, Japan and Korea. This technology is developed based on CDMA IS-95 system, which is the advancement of AMPS system. This IS-95 and AMPS systems are widely used in the USA and Korea.
- 4.4 CDMA single carrier is a standard that was developed by UWCC (United Wireless Communication Consortium) and ETSI (European Telecommunications Standards Institution). This technology is based on UWC-136 and GSM.

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**SECTION FIVE : WORKING GROUP 6 STUDY AND PROPOSAL**

- 5.1 In the absence of a Technical Forum, the Commission appointed Working Group 6 (WG6) to study the available standards for IMT-2000 to the Commission. WG6, which is chaired by Prof. Dr. Tharek Abdul Rahman from Universiti Teknologi Malaysia, is represented by industry players such as telecommunications service providers, manufacturers, a standards body (SIRIM), researchers from higher institutes of learning, as well as authorities such as the Royal Malaysian Police, Ministry of Defense and the Commission.
- 5.2 The WG had extensive discussions and proposed a standard based on the following scope:
  - 5.2.1 The Malaysian standard identifies the Malaysian IMT-2000 terrestrial specifications, based on the key characteristics identified in Recommendation ITU-R and output of activities outside ITU; and
  - 5.2.2 These specifications comply with all the 3GPP documents to form the Malaysian Standard.
- 5.3 The submission of WG 6 was used as the basis for the Public inquiry.

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**SECTION SIX : THE PUBLIC INQUIRY PROCESS FOR THE REPORT**

- 6.1 Section 60 of the CMA provides that Public Inquiry is to be conducted as and when the CMC thinks fits. The CMA also acknowledges that a Public Inquiry may be conducted in private or public.
- 6.2 The Commission carried out the Public Inquiry through the publication of a consultation paper.
- 6.3 The consultation paper was the subject for public inquiry for a period of 45 days, within which the members of the public were invited to make submissions to the Commissions about the matter.
- 6.4 Pursuant to Section 65, the CMC is thereafter obliged to publish a report of its findings as a result of the Public Inquiry within 30 days of the conclusion of the Public Inquiry. The report will then be registered and made available to the public.
- 6.5 Within 45 days from the conclusion of the Public Inquiry, the Commission must determine the standards based on report published.

**Time Frame for the Process**

- 6.7 The time frame for the process is as follows:

<b>No.</b>	<b>Action</b>	<b>Date</b>
1.	Ministerial Direction on Standard	December 11, 2001
2.	Publication of Public Inquiry via Consultation Paper	April 29, 2002
3.	Close of feedback on Public Inquiry (45 days)	At 1200 hrs, June 15, 2002
4.	Report on Public Inquiry (report to be published Within 30 days of the conclusion of the PI)	By July 15, 2002
5.	Determination of Standard by the Commission (within 45 days of the conclusion of PI)	15 days after publication of Report on Public Inquiry.

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**SECTION SEVEN : FINDINGS**

7.1 The following section deals with the input/ comments received from the public, how it was assessed and dealt with.

<b>Source of comments</b>	<b>Area of comment/ Justification</b>	<b>Suggestion/ comment</b>	<b>Result</b>
DiGi	Fully supports the proposed standard	To adopt CDMA Direct Spread (FDD) and CDMA TDD to be the Malaysian standard for IMT 2000 Terrestrial service	Noted comment
Maxis	Support and agree to the proposed standard	Agree on the standard based on the 3rd Generation Partnership Project (3GPP) specifications.	Noted comment
TimeCel	Fully supports the proposed standard recommended by the working group. Adoption of the common standard will facilitate the establishment of domestic roaming	Support of the CDMA Direct Spread and CDMA TDD standard to be adopted.	Noted comment
Telekom	<p>Malaysia to take a technology neutral position in relation to the selection of an IMT-2000 standard</p> <ul style="list-style-type: none"> <li>it is not possible at this time to say who will be the technology winner or which will be the cheapest to implement</li> <li>to adopt similar approach to previous decisions to implement competing digital standards in Malaysia and the competition between GSM/CDMA in certain countries i.e. in opinion that any technology or technology standards should not be excluded</li> </ul> <p>There has been extensive work on harmonizing both WCDMA and CDMA 2000 standards to develop Global 3G CDMA Standard that are being addressed by the CDMA Operators Harmonization Group that will inevitably enable a smooth and compatible evolutionary path to wideband</p>	Propose to include IMT 2000 CDMA Multi Carrier radio interface as one of the standards for the IMT 2000 systems in Malaysia	<p>-More than 80% of the 2G worldwide are based on GSM. WCDMA will use existing GSM core network with GPRS. Five network operators in Malaysia are based on GSM. In order to reuse the existing infrastructure for the core network, and for the benefit of the users (cost of the handset for WCDMA will be lower than CDMA2000), WCDMA will be the best choice.</p> <p>- WCDMA will be adopted worldwide by GSM/ MAP Low cost single band 3G mobile terminal</p> <p>- Harmonizing between WCDMA and CDMA2000 is difficult and still required dual mode terminals.</p>

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	<p>services globally as each standard will be able to coexist with each other.</p>		
Motorola	<ul style="list-style-type: none"> <li>MCMC should adopt a technology neutral approach to assist the operators evolve the network and the market towards 3G.</li> <li>Mandating a single IMT-2000 standard will have the effect of lessening competition in the 3G markets by depriving users of potential offerings from other IMT-2000 standards.</li> <li>It is believed that WCDMA will be the air interface standard of choice for existing GSM/MAP operator. As such</li> <li>It is noted that the adoption of a single 3G standard will avoid the need for expensive multi band 3G mobile phones.</li> <li>MCMC should note that both Japan and Korea chose to have WCDMA and CDMA2000 in both countries But agreed with the fact that: <ul style="list-style-type: none"> <li>WCDMA will be adopted worldwide by GSM/ MAP</li> <li>Low cost single band 3G mobile terminal</li> </ul> </li> </ul>	MCMC should permit all standards and not mandating a single standard for IMT 2000.	<p>-The choice of the WCDMA is based on the consensus where the members of the WG6 are from all telcos, government agencies and vendors including Motorola.</p> <p>-Japan and Korea choose to have CDMA2000 since they have IS95. Both countries still preferred to have WCDMA even they didn't have GSM network because of international roaming. All five telcos are based on GSM and the natural path to 3G is WCDMA. This will benefit the operators and users and facilitate the network sharing</p> <p>- The blue colour in the Motorola area of comment is basically supporting the choice of WCDMA.</p>
UMTS Forum	<ul style="list-style-type: none"> <li>The UMTS Forum considers that harmonized frequency arrangements together with a common standard are vital for the success of IMT-2000.</li> <li>UMTS licenses have already been awarded in many countries in ITU Region 1 and Region 3.</li> </ul>	The IMT-2000 operators in Malaysia should choose UMTS technology, which has the best potential to enable the benefits of economies of scale and global roaming.	Noted comment.
CDMA Development Group (CDG)	<ul style="list-style-type: none"> <li>The CDG urges the Commission not to adopt a mandatory standard for IMT-2000 systems in Malaysia, but rather to permit operators to select IMT-2000 technologies approved by the International Telecommunication Union (ITU) and based on their business plans and customer needs.</li> <li>In markets where operators are currently deploying IMT-2000 networks</li> </ul>	Urges the Commission not to adopt a mandatory standard and at the very least delay any decision until market analysis is conducted that would base a decision on market facts rather than expectations from a technical standards working group. The CDG believes that	<p>- One of the key features of 3G is the backward compatibility to 2G. For GSM based network the backward compatibility to 3G is WCDMA since the core network can be used for the 3G network. This will reduce the infrastructure cost. However if CDMA2000 being deployed it will required the new core network or add additional interworking function where the infrastructure cost will be high.</p> <p>- Therefore WCDMA is the "natural" upgrade path for existing GSM operators</p>

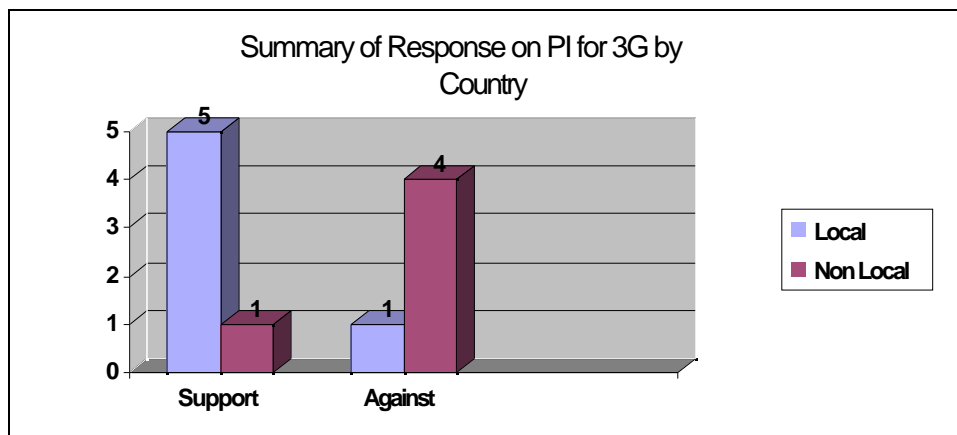
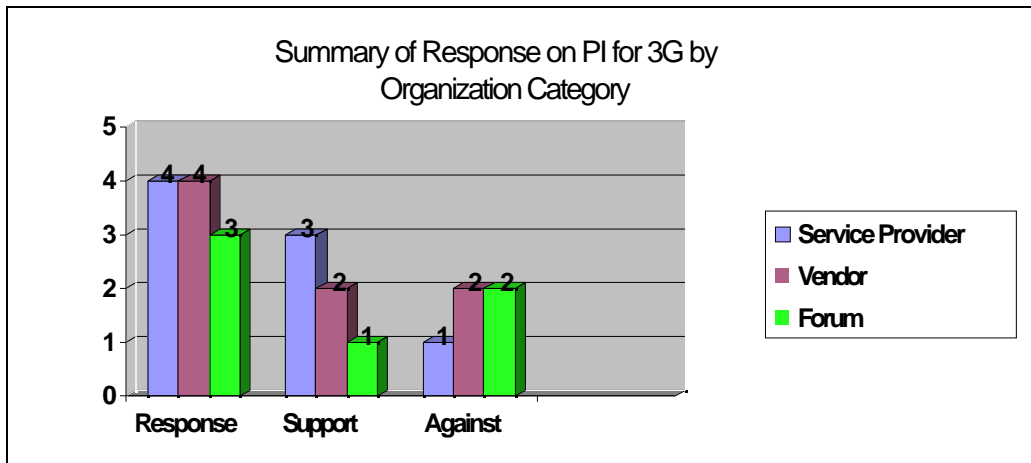
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	<p>and customers are enjoying the benefits of third generation systems (3G), governments have taken a technology neutral approach by enabling operators to select technologies and upgrade existing wireless systems based upon market demands rather than by government mandate.</p> <ul style="list-style-type: none"> <li>Challenge the conclusions of the Commission's Working Group 6 that has been used to support the Commission's inquiry and believes that the conclusions are based on market expectations rather than actual fact and certainly do not reflect the current difficulties facing deployment of WCDMA systems in Europe and elsewhere. Malaysia's GSM operators should anticipate substantial capital expenditures in the deployment of WCDMA, particularly as almost all GSM operators in Europe are building entirely new WCDMA networks</li> </ul>	<p>Commission should rely on market forces to develop advanced wireless services in Malaysia</p>	<p>For the benefit of the users, the Commission should adopt a mandatory standard i.e WCDMA.</p>
<p>Qualcomm</p>	<ul style="list-style-type: none"> <li>Urge the MCMC not to select a single mandatory standard for the implementation of IMT-2000, but rather allow mobile operators to choose any of the IMT-2000 technologies commercially available</li> <li>Experience by operators who has overlaid its existing 1<sup>st</sup> or 2<sup>nd</sup> generation network with CDMA2000, without the need to purchase new spectrum thus to be a very cost-effective path to 3<sup>rd</sup> generation services.</li> <li>Contrasts favorably with WCDMA, which requires every operator, regardless of 2G technology, to build new networks and acquire new spectrum before they can introduce new services</li> <li>The Commission's Working Group 6 recommendation reflects one of the primary misconceptions that exists in the market -- that WCDMA is</li> </ul>	<ol style="list-style-type: none"> <li>Urge the MCMC to allow 2<sup>nd</sup> generation operators in Malaysia to introduce 3G services in existing frequencies. This policy is consistent with the ITU's own radio regulations, which encourage member countries to utilize a variety of frequency bands for 3G service</li> <li>Urge the Commission to take into consideration of the submission and allow Malaysia's mobile operators to freely choose</li> </ol>	<ul style="list-style-type: none"> <li>-WCDMA will be the air interface standard of choice for existing GSM/MAP operator.</li> <li>-The adoption of a single 3G standard will avoid the need for expensive multi band 3G mobile phones.</li> <li>-Malaysia has allocated 3G frequency band based on WARC 92 which required the new frequency band.</li> </ul>

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	<p>the “natural” upgrade path for existing GSM operators</p> <ul style="list-style-type: none"> <li>• Fast deployment of 3G if using CDMA2000 technology which is already matured and tested</li> <li>• Issues of cost for network equipment and user terminal</li> <li>• Issue of interoperability</li> </ul>	<p>from among all IMT-2000 standards</p>	
TIA	<p>Believe that technology selection should be market driven and service providers themselves should make the choices.</p>	<p>MCMC shall reconsider decision to mandate a 3<sup>rd</sup> generation wireless standard in Malaysia and leave the selection of the standards to market forces.</p>	<p>-Naturally the market driven for the country having GSM core network will be WCDMA -It is believed that WCDMA will be the air interface standard of choice for existing GSM/MAP operator. - The adoption of a single 3G standard will avoid the need for expensive multi band 3G mobile phones.</p>
Ericsson	<ul style="list-style-type: none"> <li>• Proposal does reflect the industry views on the capabilities standard</li> <li>• Recommend to adopt latest Release in order to ensure the latest functionalities are incorporated</li> <li>• 3<sup>rd</sup> Generation system based on 3GPP specifications will rely on evolution from GSM network standards.</li> </ul>	<p>Support for WG6 proposal to adopt CDMA Direct Spread (FDD) and CDMA TDD</p>	<p>Noted comment.</p>
Siemens	<p>Agreed with the recommendation of the working group to adopt the CDMA FDD and CDMA TDD for IMT-2000 Terrestrial service; Agreed based on key characteristic identified by ITU-R and output of activities other than ITU Agreed that proposed specification is comply with all the 3GPP documents In addition, recommend taking up 3GPP Release 4 from the early beginning, as this release encompasses important features.</p>	<p>Agreed with the recommendation of the working group to adopt the CDMA FDD and CDMA TDD for IMT-2000 Terrestrial service.</p>	<p>Noted comment.</p>

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\*Local - Malaysian company

\*Non-Local includes Singapore, UK, USA

**SECTION EIGHT : THE WAY FORWARD**

8.1 The implementation of a mandatory IMT-2000 standard is aimed at ensuring an affordable and up to date mobile communications technology for the end-user. It will facilitate the widespread and pervasive use of the



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IMT-2000 service among the public. A mandatory standard will also enable inter-operability and infrastructure sharing by service providers.

- 8.2 It is noted that more than 80% of the 2G worldwide are based on GSM. Therefore the WCDMA will be using the existing GSM core network with GPRS and will benefit the operators and user where networks sharing are permissible. Indirectly, operators shall be investing in a low operating and infrastructure cost to upgrade to the IMT-2000 mobile standard. End-user shall be complied to all network operators since it is required to one mode terminal due to the compatibility.
- 8.3 There has been an extensive work on harmonizing both WCDMA and CDMA 2000 standards to develop Global 3G CDMA Standard that are being addressed by the CDMA Operators Harmonization Group. Nevertheless the harmonization between WCDMA and CDMA 2000 will be the main agenda for the future and the Commission will be following closely the progress of this harmonization.

**APPENDIX : COPIES OF SUBMISSION RECEIVED**

- 1) DiGi Telecommunications Sdn. Bhd.
- 2) Maxis Mobile Sdn. Bhd.
- 3) TIME dotCom Berhad.
- 4) Telekom Malaysia Berhad.
- 5) Motorola, Singapore.

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- 6) UMTS Forum, U.K.
- 7) CDG, U.S.A.
- 8) Qualcomm, U.S.A.
- 9) TIA, U.S.A.
- 10) Ericsson (M) Sdn. Bhd.
- 11) Siemens Malaysia Sdn. Bhd.