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| **From:** | ENAV Committee | ARM16-6.2.1  (ENAV29-12.2.3) |
| **To:** | VTS Committee  ARM Committee  ENG Committee | 25 March 2022 |

**LIAISON NOTE**

**Developments in International Mobile Telecommunications (IMT) related to termination of 2G and 3G services in selected countries**

# introduction

As identified in the ENAV WG Terms of Reference, WG2 reviews emerging digital technologies that may be suitable for use by IALA members. This work has resulted in a review of International Mobile Telecommunications (IMT) developments, including regular updates from the 3rd Generation Partnership Program (3GPP)

# Background

The developments of mobile telecommunication technology are integrated into day-to-day life, with the development of 3G, 4G and now 5G. The International Telecommunication Union (ITU) has termed these developments ‘International Mobile Telecommunication’ or IMT.

# Discussion

Through the development of IMT there are different generations of technologies that have been identified. This includes the technologies commonly referred to as 2G and 3G.

Noting that many AtoN systems, ports and ship environments use IMT technology for a wide variety of purposes, IALA is advised that different countries are now terminating what are known as 2G and 3G services.

Services that were using 2G and 3G will now need to be migrated to alternative technologies including 4G and 5G. It has been advised that 4G will remain to be supported and that the 4G and 5G have an expected operational life span of greater than 10 years.

Information on the developments of IMT are provided in the presentation from 3GPP to the IALA ENAV Committee, link to the recording of the presentation could be found [here](https://youtu.be/QWZDKdLDl9k) and the supporting [material](https://nextcloud.iala-aism.org/index.php/s/ii63Hk43xbjJcGs).

# Action requested

The VTS, ARM and ENG Committees are requested to:

* Note the termination of 2G and 3G services in selected countries, with the migration to alternative technologies including 4G and 5G services.

*Annex: Table outlining 1G, 2G, 3G, 4G and 5G major system milestones.*

Annex

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| **Generation** | **Major Systems Milestones** |
| 1G | Analogue technology, from the 1980s onwards. Various technologies were deployed, Nationally or Regionally, including:   1. NMT (Nordic Mobile Telephone), 2. AMPS (Advanced Mobile Phone System), 3. TACS (Total Access Communications System), 4. A-Netz to E-Netz, 5. Radiocom 2000, 6. RTMI (Radio Telefono Mobile Integrato), 7. JTACS (Japan Total Access Communications System) and 8. TZ-80n (Source:[wikipedia](http://en.wikipedia.org/wiki/1G)) |
| 2G | First digital systems, deployed in the 1990s introducing voice, SMS and data services. The Primary 2G technologies are:   1. GSM/GPRS & EDGE, 2. CDMAOne, 3. PDC, 4. iDEN, 5. IS-136 or D-AMPS. |
| 3G  IMT 2000 | The 3G system from 3GPP is based on evolved Global System for Mobile communication (GSM) core networks and the radio access technologies that they support.  This has allowed for the maintenance and development of GSM, with the evolution of General Packet Radio Service (GPRS) and Enhanced Data rates for GSM Evolution (EDGE), as well as further developments with the Universal Mobile Telecommunications System (UMTS) and High-Speed Packet data Access (HSPA).  3G brought a global vision to the evolution of mobile networks, with the creation of the ITU's family of IMT-2000 systems which included EDGE, CDMA2000 1X/EVDO and UMTS-HSPA+ radio access technologies. |
| 3G/4G  IMT Advanced | LTE and LTE-Advanced have crossed the “generational boundary” offering the next generation(s) of capabilities. With their capacity for high-speed data, significant spectral efficiencies and adoption of advanced radio techniques, their emergence has been the basis for all new mobile systems from Release 8 onwards.   It should be noted that LTE-Advanced (From Release 10) is 3GPP's ITU-R IMT-Advanced radio interface. LTE-Advanced is the first true 4G technology to be specified by 3GPP.  LTE-Advanced Pro is the name that helps the industry describe what has been achieved with the completion of Release 13. LTE Pro is set to be used by other sectors, beyond telecoms, including Critical Communications (blue light services & other Mission Critical systems), the machine-to-machine or Internet of Things (IoT) sector, Transport (Rail, ITS, etc), Education and many other areas. LTE-Advanced Pro is 3GPP's steppingstone to 5G systems. |
| 5G  IMT2020 | 5G brings another major technology step, with the creation of a 'New Radio' (NR).  Unlike with 4G, where 3GPP hesitated to join the generational march onwards beyond 3G, 3GPP have embraced the alignment of the industry on NR and on LTE-Advanced Pro to provide 5G – from 3GPP Release 15 onwards. |