



## Technical Talk on Coexistence of 5G and Satellite Services in the C-Band

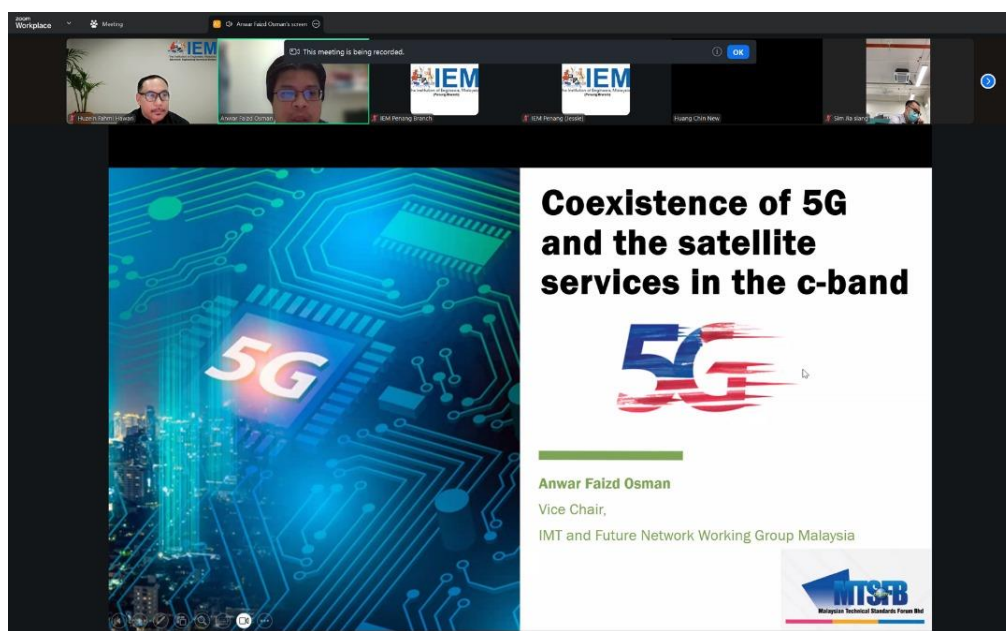
By

Ir. Dr. Huzein Fahmi Hawari

He is the eETD Chairman for 2025/2026.

The Institution of Engineers, Malaysia (IEM), through the Electronic Engineering Technical Division (eETD), in collaboration with the IEM Penang Branch, successfully organised an online Technical Talk titled “Coexistence of 5G and Satellite Services in the C-Band.” The session was held on Friday, 7 November 2025, from 10.00 am to 12.00 pm, and was delivered by Anwar Faizd Osman, an expert in RF design, wideband low-noise amplifiers, and 5G product development. The talk was moderated by Ir Dr Huzein Fahmi Hawari.

A total of 45 participants attended the session, comprising engineers, industry practitioners, researchers, and postgraduate students from the telecommunications and satellite sectors. The programme aimed to provide an in-depth understanding of the increasing demand for 5G deployment in the mid-band spectrum, specifically the C-Band and its implications for existing Fixed Satellite Service (FSS) operations.



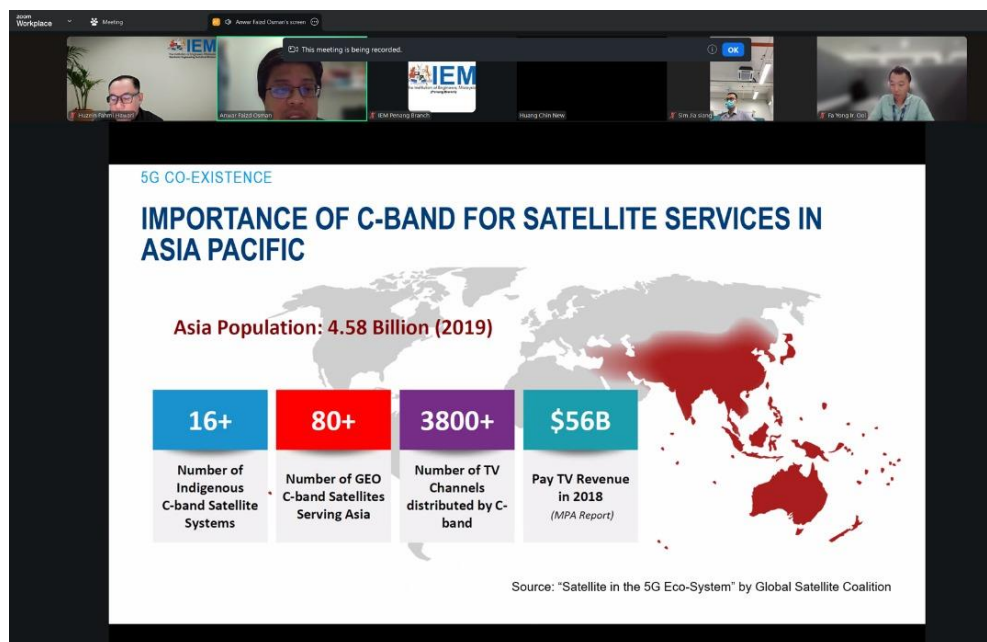
Mr. Anwar delivering his opening remarks.

In his presentation, he highlighted the strategic relevance of the 3.3–3.8 GHz 5G C-Band, which forms a major part of the 3GPP N78 band plan. He explained that this spectrum has become a global favourite for early 5G rollouts due to its favourable propagation characteristics and its ability to deliver high network capacity. He further emphasised that the 3.5 GHz ecosystem currently enjoys the widest availability of compatible user equipment and base station support, as reported by the Global Mobile Suppliers Association (GSA).

The talk then addressed the long-standing use of the 3.4–4.2 GHz spectrum by the global satellite industry for critical FSS operations. These include large gateway earth stations, telemetry and command systems (TT&C), VSAT networks, and SMATV services. He provided a regional overview demonstrating the heavy dependence of the Asia Pacific region on C-Band satellite services, supported by more than 80 GEO satellites, 16 indigenous satellite systems, and over 3,800 TV channels distributed through C-Band, contributing to a significant USD 56 billion Pay-TV revenue in 2018.

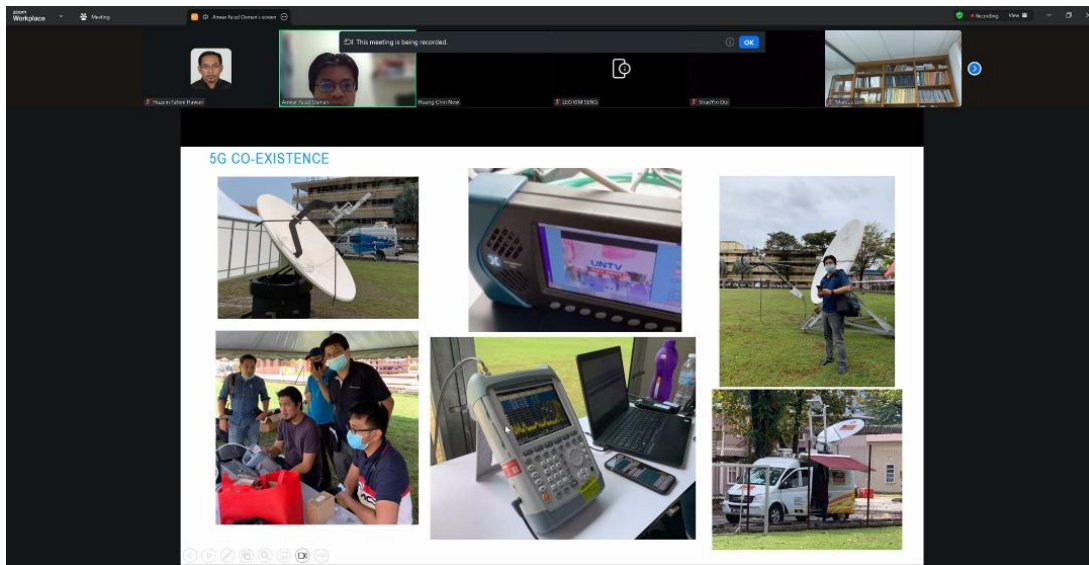
A major focus of the session was the challenge of coexistence between terrestrial 5G networks and satellite systems operating in adjacent spectrum blocks. Mr. Anwar explained that the deployment of 5G base stations introduces two primary interference concerns for FSS receivers:

1. Unwanted Signal Interference – Downlink signals from 5G gNB transmitters may leak into the satellite receiver's band, degrading the quality of the desired satellite signal.
2. Receiver Blocking (Saturation) – Considered the most critical issue, this occurs when strong 5G signals—whether in-band or out-of-band—overload the low-noise amplifier of an FSS receiver, causing temporary loss of service.



Importance of C-Band for Asia Pacific

To ensure continued coexistence, he presented widely adopted mitigation techniques, including the implementation of optimum guard bands, band-pass filters, and C-Band restructuring initiatives planned by national regulatory bodies. He also provided live demonstrations on how guard bands are measured and optimised to minimise interference and maintain service integrity for both 5G networks and satellite operators.



Field testing conducted by the speaker and his team

The talk offered valuable insights into the engineering considerations required to balance emerging telecommunications demands with the operational needs of incumbent satellite services. Participants gained a deeper understanding of the technical, regulatory, and practical aspects involved in ensuring harmonious spectrum sharing in the C-Band.

Overall, the event was well-received and successfully fulfilled its objective of enhancing professional awareness on 5G–satellite coexistence issues. It also reflected IEM eETD’s ongoing commitment to supporting continuous professional development and promoting informed, technology-driven solutions for the national telecommunications landscape.

