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Session 4: Innovation in Satellite L-Band connectivity

PROMOTING THE USE OF SATELLITE L-BAND SPECTRUM
WORKSHOP 19th OCTOBER 2021

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Viet Nam Vision for Digital Transformation

"As the world is still severely affected by the COVID-19 pandemic, digital technologies and services have proven their superiority when it comes to flexibility and creating a conducive environment for ideas and initiatives to overcome challenges, safely adapt to the pandemic, and engage in sustainable economic recovery and growth. The Government of Viet Nam considers the digital and data infrastructure, alongside its national digital platforms, to be a key factor."

The Prime Minister, Pham Minh Chinh, @ ITU Digital World 2021 on 12 October.

Digital Transformation through evolution of a unique, multi-dimensional, dynamic mesh network

L-BAND
A critical layer of always-on connectivity with all-weather resilience.

GLOBAL XPRESS
Reliable, high-speed, global coverage with security and full redundancy.

TERRESTRIAL 5G
Ultra-high capacity at high demand hot spots - supplemented by the power of dynamic wireless mesh networking.

LEO
Small complementary constellation layering additional high capacity over further high demand areas.

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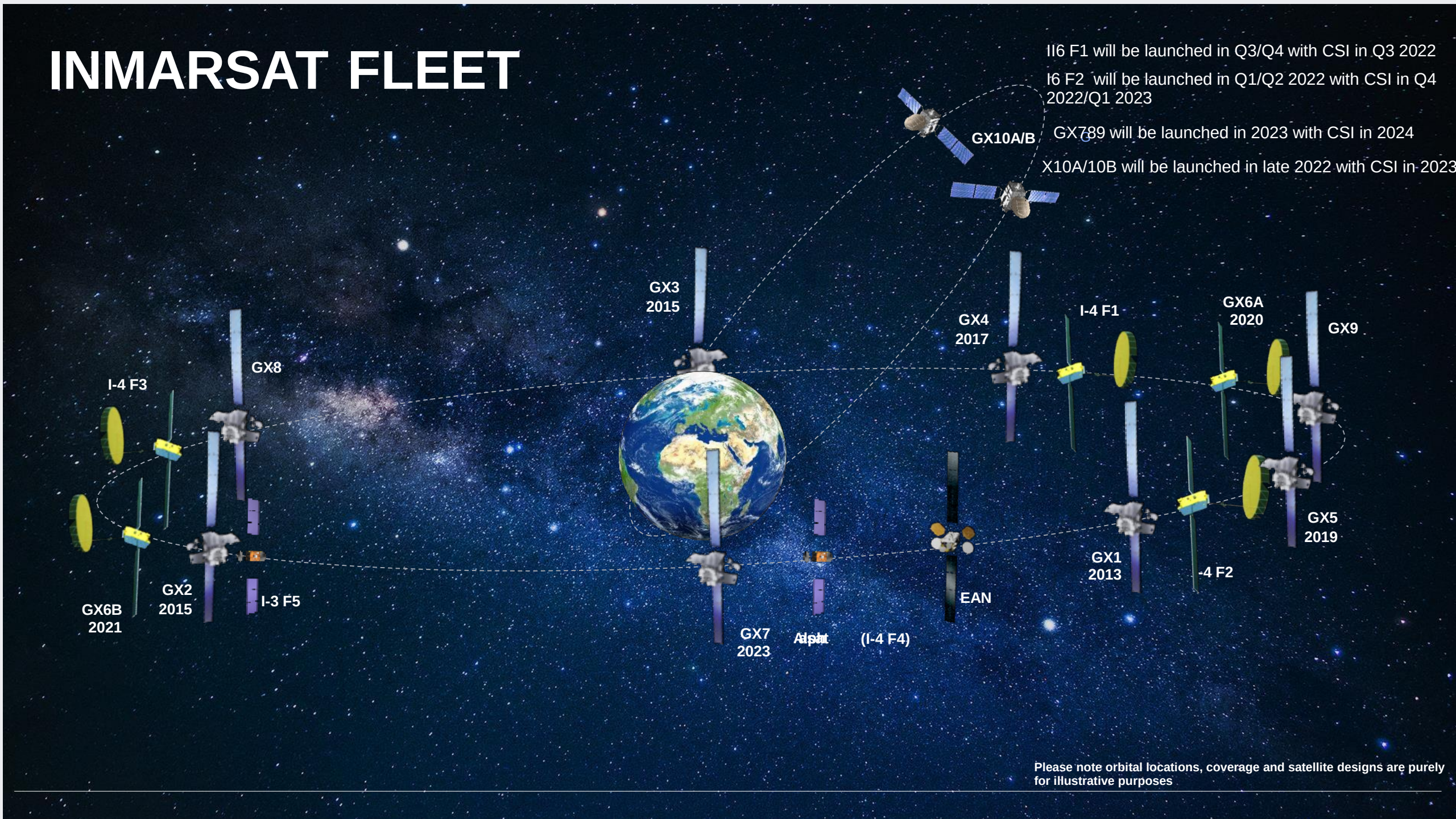
INMARSAT FLEET

II6 F1 will be launched in Q3/Q4 with CSI in Q3 2022

I6 F2 will be launched in Q1/Q2 2022 with CSI in Q4 2022/Q1 2023

GX789 will be launched in 2023 with CSI in 2024

X10A/10B will be launched in late 2022 with CSI in 2023



Please note orbital locations, coverage and satellite designs are purely for illustrative purposes

Inmarsat's ELERA L-Band Portfolio of Services Powering Connectivity on Land, Sea and Air

- New spectrum management capabilities (known as Carrier Aggregation) being incorporated into the ELERA network will deliver the fastest speeds globally available to L-band customers (1.7Mbps), far outstripping the capabilities of any other worldwide L-band network.

- Creation of the smallest footprint, low cost terminal for L-band users, delivering the ideal framework for satcom IoT at scale, with supporting cloud-based management, for vertical sectors such as infrastructure, rail, logistics, mining, agriculture, government, maritime and aviation.

- A major extension to Inmarsat's portfolio of voice-enabled devices, which represents our focus on voice service innovation and underlines the company's long-term commitment to the handheld voice over satellite market sector.





Portfolio of ELERA L- Band Applications

ELERA enables L-band airborne intelligence, surveillance for Unmanned vehicles

High-throughput connectivity

ELERA enables L-band enhances agriculture productivity & food security

Real-time operations & monitoring

ELERA is a global narrowband satellite network – ideally suited for IoT

ELERA, the latest evolution of L-band network

SATELLITE FOR 5G: CONNECTING THE UNCONNECTED

- L- Band Satellite capacity will also be key for **extending 5G backhauling into more remote areas**
- Satellite provides high bandwidth, ubiquitous service beyond cities and unreachable areas, **supporting data delivery at the edge and enabling network availability for communications on moving platforms**
- Beyond 5G backhauling, **Hybrid L-band solutions will support a wide range of new 5G applications** such as connected vehicles and autonomous driving, Inmarsat's unique solutions could efficiently support the firmware or software over-the-air ("FOTA/SOTA") updates, map updates and real-time traffic conditions and parking availability

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FUTURE EVOLUTION OF L-BAND CONECTIVITY

Urban Air Mobility - complete command and control network for the safe operation of autonomous flying taxis and personal UAVs.

Next Gen Safety – future emergency safety services, including enhanced real-time collaboration and expanded data collection.

Extending Inmarsat's services for the first time for small coastal vessels, offshore energy platforms and remote operations for autonomous vessels

Large Scale Industrial IoT

Secure, device-neutral, private networks that allow customers to integrate, connect, manage and monitor via a single cloud environment.

Secure Tactical Private Networks

Bespoke, high-speed, local area, temporary sovereign networks to connect emergency and humanitarian aid teams in field while securely relaying critical data home for analysis.

New multi-band, low SWaP terminals will also extend Inmarsat's services for UAV, short-range ISR, HELO and sensor/IoT.

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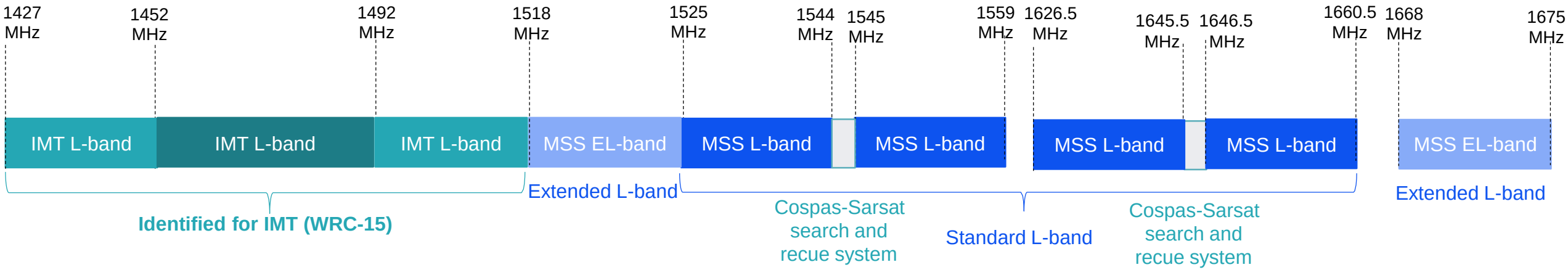
L-BAND SPECTRUM OVERVIEW



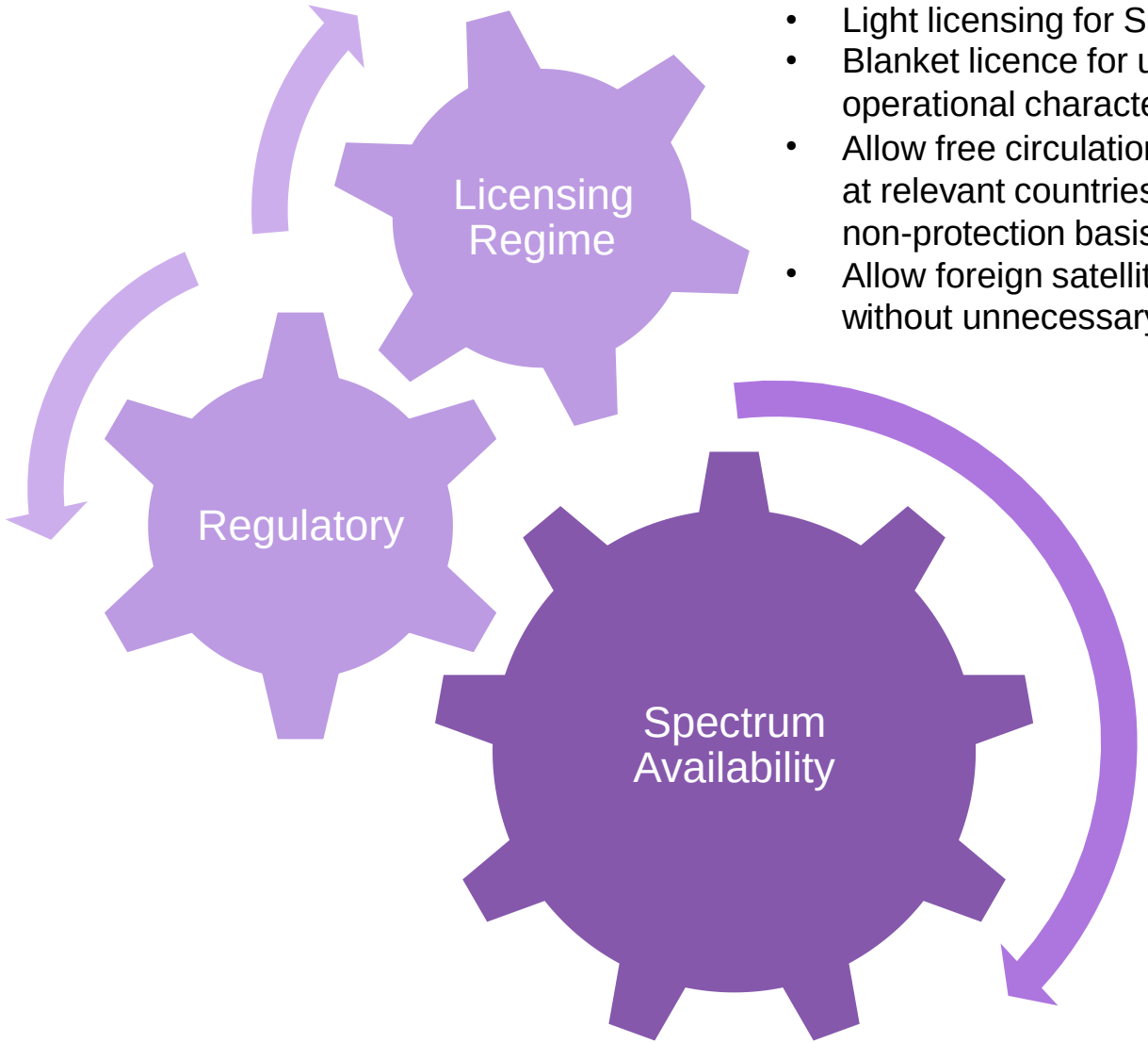
Critical band for current & future satellite services (including safety services e.g. GMDSS)





SPECTRUM & REGULATORY CERTAINTY

- Light licensing for Satellite IoT
- Blanket licence for user terminals with similar technical / operational characteristics
- Allow free circulation for foreign satellite terminals (licensed at relevant countries) to operate on a non-interference and non-protection basis without licence
- Allow foreign satellite operators to apply for relevant licences without unnecessary requirement (e.g. local entity)



- Reduce regulatory hurdles or to encourage deployment of satellite services (e.g. landing rights requirement, reasonable spectrum pricing)
- Recognition of test report from accredited international test lab
- Support WRC-23 agenda items (e.g. AI 1.2, AI 1.6, AI 1.17)

- **Critical to protect existing spectrum allocation 1518–1559 MHz**
- **Continued access to sufficient spectrum for both current and future needs**

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CONCLUSION – FUTURE OPPORTUNITIES FOR VIETNAM

- Currently Satellite L- Band spectrum (1518-1559 MHz) is extensively utilised across a portfolio of services and applications as noted
- Critical applications include safety related services for Land mobile, Maritime and Aeronautical operations that include GMDSS and GADSS that requires safeguarding and protection
- Future evolution of Satellite based L-band services provides tremendous scope and opportunity for Vietnam to integrate within its digital platform and to promote within the Region
- Inmarsat's Orchestrate further provides opportunities for Vietnam to consider integration of multiple access technologies as part of its national digital transformation and to export this innovation to other neighbouring countries
- Inmarsat's welcome close cooperation with Vietnam to consider how best to bring about innovative solutions to its national transformation requirements

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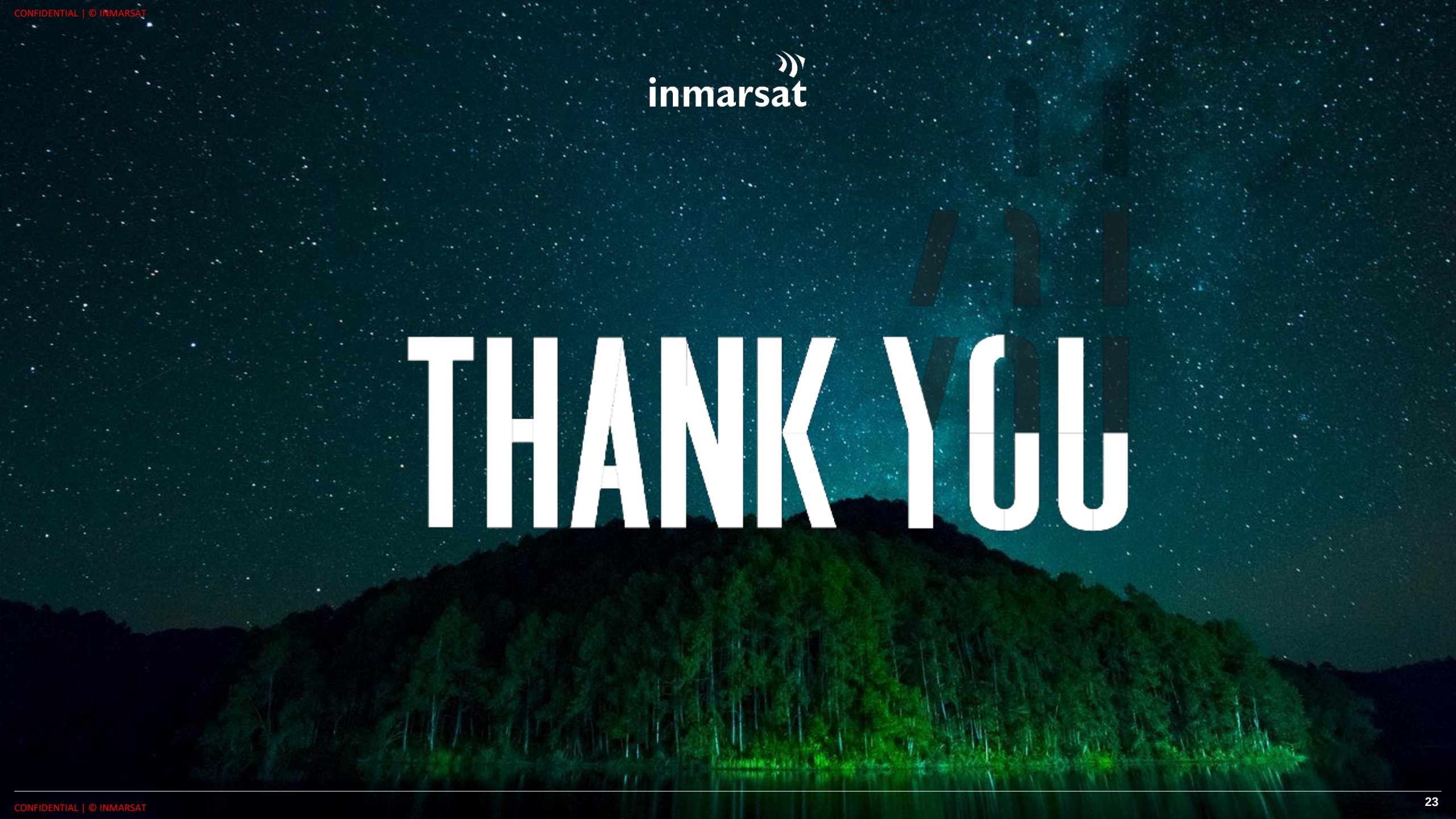
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THANK YOU