Inter-ministerial Board Workshop
Poland
Space for 5G and Digital Transformation
Space Systems for Safety and Security

Warsaw
29 May 2019

Hermann Ludwig Moeller, European Space Agency
ESA Directorate of Telecommunications and Integrated Applications
Head of Institutional and European Programmes Office
Digital transformation is the integration of digital technology (ICT) into all areas of a business and society, fundamentally changing how businesses operate and deliver value to customers.
Connectivity as key enabler of Digital Transformation

Connectivity:
- Anytime
- Anywhere
- Any Volume
- Any Thing (M2M/IoT)
5G Connectivity and Digital Transformation

Transforming Business Models

What will 5G bring you?

- Amazing volume
- Amazingly fast
- Always best connected
- No perceived delay
- Massive amount of connected things and people
- Energy efficiency
- Secure networks
- Flexible integrated programmable networks
- Internet of things, smart cities, connected cars, e-health
- 5G applications

- Histogram TV, immersive presence, augmented reality, ultra large volume transfers
- Staying connected everywhere including high-speed trains, planes, ships, crowds
- Staying connected everywhere including high-speed trains, planes, ships, crowds
- New business models for provision of network functions, emergence of super MN0s, pan-European hybrid networks, faster innovation in network services
- Networks for police, civil protection, public safety and security professionals

ESA UNCLASSIFIED - For Official Use
Role of Satcom in 5G and the Digital Transformation

Space for 5G provides:
- Ubiquitous coverage
- Resilience
- Security

Seamless Integration of Space and Terrestrial Connectivity and Services
ESA SPACE19+ Strategic Programme Line S45G

Technology developments

Applications & Services

Validations Trials
Vertical Pilots
ESA SPACE19+ Strategic Programme Line S45G

1. Develop & Demonstrate seamless integration 5G space/terrestrial technologies

2. Enable 5G Satellite services

3. Reach out to the 5G terrestrial community and standardisation bodies to promote awareness and integration with satellite

4. Coordinate with 5G national and international bodies

5. Promote User Trials and Pilots to support terrestrial and satellite 5G services into user segments
5G Verticals and Use Cases
Considerations for Poland

Satellite integration in 5G will drive much of the growth in these verticals.
Space as enabler of the “Digital Transformation” in Poland
Connectivity for key sectors of industry and society
5G Use Cases: Examples

Maritime Transport
- Asset tracking & cargo logistics
- Remotely connected sensors
- Fleet management
- Autonomous shipping

Digital Divide
- Provide 5G connectivity to underserved and remote regions
S45G – Technological Opportunities for Poland

• S45G is software centric
  → Opportunity for spin-in from ICT SW industries into Space sector

• S45G requires seamless integration of terrestrial and space communications
  → Opportunity for spin-in from TELCO
https://artes.esa.int/satellite-5g

5G@esa.int
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ESA Space Safety & Security

Space Safety – a single programme

Cybersecurity of all activities

from Space

Disaster Management

Maritime

Food

QKD

SWE

in Space

Collision avoidance autonomy

Planetary Defence

Debris

Cybersecurity of all activities

Safety and Security Applications – several programmes
ESA Space Systems for Safety & Security (4S)

TRANSPORT

CRITICAL INFRASTRUCTURE

SPACE

GOVERNMENTAL
4S Use Cases: Examples

Transport
- Maritime Safety

GOVSATCOM
- Border Control
- Crisis Management
- Common Security and Defense Policy (CSDP) missions for peacekeeping operations and conflict prevention
ESA GOVSATCOM Precursor – PACIS Projects
ESA Secure Satcom for Safety & Security Applications
ESA Announcement of Industrial Opportunity

- ESA AO issued 1 February 2019
- Objective: Industrial Outline Proposals for SPACE19+
- Covering 2020-2025 timeframe and preparation 2025-2030
- Addressing R&D/Product development/Core Competitiveness, Secure Satcom Projects and GOVSATCOM-related Project, as well as Business Applications
- ESA Industry AO Workshop on 4 April 2019 in Bucharest
- Specific Eastern Europe Industry WS considered for September 2019
- SPACE19+ ambition: 250MEURO
### ESA Secure Satcom for Safety & Security Applications

#### ESA Announcement of Industrial Opportunity

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<tbody>
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<td><strong>CORE COMPETITIVENESS for 4S</strong> (including ScyLight)</td>
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<td>Secure Satcom Projects</td>
<td>IRIS IRIS for ATM Deployment</td>
<td>e.g. Beyond ATM</td>
<td>e.g. Technology for NG Secure Satcom</td>
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<td>EDRS Global EDRS-Global Phase C/D/Et</td>
<td>e.g. Digital Sky</td>
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<td>Institutional QKD OTHER</td>
<td>e.g. EDRS for NG Copernicus Sentinels, RPAS</td>
<td>e.g. NG Data Relay</td>
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<td>OTHER</td>
<td>Precursor</td>
<td>e.g. Part of NG secure Satcom</td>
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#### GOVSATCOM-related Projects

| Precursor Phase 2 | Integration into Pooling & Sharing Hubs; Extension of demonstrations and downstream service developments | e.g. Arctic Precursor | / |
| Pooling&Sharing HUB Phase A/B | Version 1 Hub Implementation | | |

| Space Component Segment 1 | | New National secure Satcom assets; Security augmented commercial secure satcom assets; IOV/IOD | |

### OTHER

| BUSINESS APPLICATIONS for 4S | e.g. Extension of Precursor PACES demonstration downstream to create demand pull from civilian user base | e.g. development of new vertical sectors; AI; RPAS/HAPS | |

### GENERIC

| | | e.g. Cybersecurity | |
Outlook – Cutting Edge for Secure Communications

- Institutional QKD Precursor Mission - SAGA
THANK YOU