ASIA-PACIFIC TELECOMMUNITY
The 35th Meeting of the APT Wireless Group (AWG-35)
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IAFI[1]

PROPOSAL FOR FURTHER UPDATES TO THE WORKING DOCUMENT TOWARDS A DRAFT NEW APT REPORT ON USAGE OF CELLULAR INTEGRATED SENSING AND COMMUNICATION (ISAC) FOR SMALL UNMANNED AIRCRAFT SYSTEMS (UAS) IN ASIA PACIFIC REGION

1. Introduction

AWG-34 meeting considered one input (INP-73 (VTN)) and agreed to a new work item and To develop a new report on the Usage of Cellular Integrated Sensing and Communication (ISAC) for Small Unmanned Aircraft Systems (UAS) The draft working document AWG-34/TMP-46 was agreed and forwarded to AWG-35. The Report deals with Cellular Integrated Sensing and Communication (ISAC), which is an emerging technology that combines wireless communication and radio sensing within a single system. This integration allows mobile networks not only to transmit data but also to sense and gather information about their surrounding environment, including detecting objects, tracking movement, and analyzing spatial data. ISAC is considered a key enabler of future 6G networks, enhancing efficiency and optimizing spectrum resources.

2. Proposal

Further updates are proposed to the working document.

Attachment: As above

[1] IAFI (ITU-APT Foundation of India) is an Affiliate Member of APT

Contact: **Email:**

Attachment

WORKING DOCUMENT TOWARDS A DRAFT NEW APT REPORT ON USAGE OF CELLULAR INTEGRATED SENSING AND COMMUNICATION (ISAC) FOR SMALL UNMANNED AIRCRAFT SYSTEMS (UAS) IN ASIA PACIFIC REGION

1. Introduction

The Asia-Pacific Telecommunity (APT) Wireless Group is tasked with advancing wireless communication technologies to meet the evolving needs of the region. Cellular Integrated Sensing and Communication (ISAC) is an emerging technology that combines wireless communication and radio sensing within a single system. This integration allows mobile networks not only to transmit data but also to sense and gather information about their surrounding environment, including detecting objects, tracking movement, and analyzing spatial data. ISAC is considered a key enabler of future 6G networks, enhancing efficiency and optimizing spectrum resources.

The integration of sensing and communication capabilities unlocks numerous applications across various sectors:

a) Smart Transportation & Autonomous Vehicles
- Enhances vehicle-to-everything (V2X) communication for safer, more efficient traffic management.
- Provides precise environmental awareness for self-driving cars and drones.

b) Security & Surveillance
- Enables passive radar-like capabilities for UAV detection and intrusion monitoring.
- Supports law enforcement and border control with real-time situational awareness.

c) Healthcare & Assisted Living
- Tracks human movement for fall detection in elderly care facilities.
- Enhances remote patient monitoring with non-invasive sensing technologies.

d) Industrial Automation & Smart Cities
- Facilitates real-time asset tracking in warehouses and manufacturing plants.
- Helps optimize energy use and infrastructure monitoring in smart city applications.

e) Immersive Technologies (AR/VR)
- Improves location-based services for augmented and virtual reality experiences.
- Enhances real-time object recognition and environmental interaction.

When applied to Unmanned Aircraft Systems (UAS), Cellular ISAC offers significant potential to enhance operational efficiency, safety, and connectivity in diverse applications such as surveillance, logistics, and disaster management.

2. Background

ISAC leverages shared RF spectrum and hardware to perform dual functions: communication (data transmission) and sensing (environmental perception). UAS, including low-altitude UAVs,

are increasingly integrated into cellular networks, acting as aerial users, relays, or base stations. The APT region, with its diverse geography (urban centers, rural areas, and island nations), rapid UAS adoption, and spectrum management challenges, presents a unique context for Cellular ISAC deployment. Recent global research highlights UAS-enabled ISAC as a key enabler for 6G, yet region-specific studies remain limited.

3. R&D, standardization and implementation status of cellular ISAC on UAS
3.1 national research and trials
3.2 global standardization activities
3.3 technical use cases
3.4 implementation status

4. Technical and regulatory considerations

[4.1. Spectrum allocation and efficiency of uasage
[TBD]

4.2. Propagation channel modeling
[TBD]

4.3. Interference and mitigation techniques]
[TBD]

4.4. Integration with existing and future networks
[TBD]

[4.5. Regulatory harmonization among APT region]
[TBD]

4.6. Operational requirements
[TBD]

4.7. Safety and security matters
[TBD]

5. Country case studies
[TBD]

6. Summary
[TBD]