Submission 133 – ANRA Technologies

Department of Infrastructure, Transport, Regional Development, Communications and Arts
Discussion Paper for Public Consultation
Remote Identification

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Thesis

Australia would greatly benefit from additional research beyond this public consultation that will deliver critical, data driven foundational insights to inform the Remote ID (RID) decision making process.

Introduction

The increasing growth of drone operations in Australia raises concerns about safety, accountability, security, and regulatory compliance. RID, which is being adopted in the US and Europe, is seen as a solution to these concerns and an essential component for a UAS Traffic Management (UTM) ecosystem. However, deploying RID in the Australian context requires specific investigation due to variations in network connectivity, types of operations, and volumes in different areas. Without this understanding, developing (or adopting) accurate Australian RID standards and integrating them into the regulated UTM architecture will be challenging. The lack of evidence-based deployment knowledge and guidelines tailored to Australian requirements and use cases could have negative implications for various drone operations, including defence drones, drone delivery services, emergency drones, and recreational drones, hindering their harmonious functioning.

The aforementioned factors provide motivation for the Department of Infrastructure, Transport, Regional Development, Communications and Arts (DITRDCA) to consider the following:

- Formalisation of a technical specification of RID requirements and development of a technical implementation or Australia
- Develop a reference architecture for the proposed standard with a proof-of-concept demonstrator.

The technical specification of RID requirements should be verified and validated through manual checks and developed scenarios. The proposed technical specification for Australia should be implemented and demonstrated, providing a reference implementation. The developed reference architecture should be evaluated via field testing, user feedback and comparative analysis. This broader, end-to-end research would consider the entire RID ecosystem to ensure the best decision is made for Australia.

A Case for Further RID Research

While drone RID will be required by both FAA and EASA in 2023 and 2024, respectively, there is a need for prototyping and deployment in the Australian context. DITRDCA should consider two existing major standards for Remote ID already developed in the USA (ASTM – F3411-19 - https://www.astm.org/f3411-19.html) and the EU (ASD-STAN – prEN 4709-002 - https://asd- 9 stan.org/downloads/asd-stan-pren-4709-002-p1/). Additionally, RID should be disseminated within a UTM environment that uses international interoperability standards.

DITRDCA should consider what works best for an Australian implementation for an on-drone deployment using on ground detectors of broadcasted RIDs from drones, as well as a database for storage and processing of drone related information. This should include privacy maximisation (including multiple levels of access to data according to authorisation levels) and network security issues as well as socio-ethical principles of identification must be factored, e.g., in terms of content of RID messages, while balancing utility in view of applications (e.g., safety, enforcement and tracking) and performance criteria.

RID will be a key technology for safe and traceable advanced uses of drone services for regional (and urban) areas. DITRDCA should play a critical role towards conducting comprehensive investigations, leveraging this public comment opportunity but also should strongly consider data driven assessments.

While lessons can be learned from RID deployments in other regions, many aspects are dependent on the country domain and thus, needs to be specifically investigated for Australian context, especially considering the specific requirements and constraints in regional Australia. Without understanding how this crucial technology should be deployed in Australian contexts, it will be challenging to accurately develop Australian RID standards (or adapt current standards) and integrate with Australia's regulated UTM architecture.

Without investigation of the variation of network connectivity across Australia, as well as considerations of types and volumes of operations in specific areas, it will not be feasible to develop secure and applicable RID technologies that address the actual local requirements and constraints. Lack of deployment know-how and guidelines catered for Australian requirements and use cases, will have negative implications on the harmonious functioning of various drone operations, such as defence drones, drone delivery services, emergency drones, and recreational drones.

DITRDCA would be well served to consider the following areas for a more detailed, data driven investigating regarding RID implementation for Australia:

- *Formalisation of remote ID requirements in the Australian context*: Cellular-based Network RID (NRID) may not be feasible across many remote and regional areas in Australia due to lack of a reliable cellular network. Hence, more research is needed for Broadcast RID (BRID) (e.g., WiFi/Bluetooth based) with the potential to convert to NRID in some situations, while considering Australian geographical constraints such as terrain and topography, and costs (financial, energy) in various key scenarios specific to Australia. DITRDCA should consider key application scenarios in urban vs regional and remote areas, including commercial drone delivery applications, agricultural scenarios, supply of essential items and disaster scenarios such as in bushfires.

Benefits: This will provide a specification of remote ID requirements for drones in Australia and provide the foundation for the proposed project.

- *Development of Australian RID implementation:* Implementation of RID is important for setting the drone policies in Australia. Based on the requirements identified for Australian context, and existing international and other country standards, DITRDC should investigate a set of technical recommendations for RID, including aspects such as message formats, transmission methods, minimum performance requirements, and data standards, and produce a prototype implementation of Australian RID accordingly.

  Benefits: This will provide an Australian RID reference architecture, enabling the verification of the technical design and ensuring that implemented remote ID system meets the requirements and regulations set by relevant aviation authorities or governing bodies.

- *Experimental technical investigation and feasibility analysis:* DITRDCA should consider how to develop a reference architecture and then demonstrate that architecture for remote ID integration and experimentally evaluate the design with different wireless hardware, drone types, and performance metrics for selected drone deployment configurations representative of key Australian use cases. The research should focus on BRID technology, but a key aspect will be the investigation of methods to convert BRID into NRID and a proof-of-concept architecture demonstrating feasibility of this technology. BRID information is only accessible to receivers direct connected (such as via Wifi or Bluetooth). Hence, while BRID provides a solution for areas without reliable cellular network, methods are still needed to integrate BRID data to the broader UTM network, which will be investigated in this project. Converting BRID to NRID will also provide cloud-based centralised access to RID information, enabling various analytics capabilities.

  Benefits: This will enable a comprehensive analysis of the developed reference architecture under real-world contexts specific to Australia, giving stakeholders a broad and in-depth understanding of the proposed RID implementation, and facilitate incorporation of feedback and recommendations.

Sought After Outcomes

We encourage DITRDCA to strongly consider data-driven research that builds upon the public comment to facilitate a faster, more efficient, and/or automated approval process to operate in airspace for which drones may need permissions. RID can improve regulatory and law enforcement agencies' situational awareness of drone activities. This supports faster and more accurate responses, more accurate identification and attribution, and enables an electronic record of drone activities that can support investigations and (if necessary) further prosecution. NRID, combined with other systems, can present a technical solution that enables authorised users to consult historical information to determine whether drone activity was unlawful, including to identify patterns of behaviour.

We also encourage DITRDCA to facilitate an integrated drone information repository. Now, drone registration with CASA is required in Australia for non-recreational uses and may be required for

recreational uses in the future. Drone registration data by itself does not provide identifiable in-flight drone information. However, integrating drone registration data with RID can provide a more useful, identifiable, and streamlined data set that can also help with enforcing regulatory compliance. These outcomes will lead to accountability, enhanced safety, public acceptance and the potential to for an integrated drone information repository where drone registration data with CASA can be integrated with remote ID to provide a more useful, identifiable, and streamlined data set that can also help with enforcing regulatory compliance

Conclusion

ANRA Technologies appreciates the opportunity to provide comments for this RID consultation efforts and applaud the vision that DITRDCA has demonstrated to provide the best solution for Australia. However, it's been our experience conducting similar efforts in the US, EU, and UK that a more technical and effort must be considered that involves test and evaluation of architectures, technical specifications, and their relationships to the broader ecosystem to obtain data-driven outcomes to better inform the decision-making process.