SURF LIFE SAVING NSW · COMMUNICATIONS SYSTEMS

Drone-in-a-Box for Emergency Services

Resilient connectivity beyond terrestrial networks

SURF LIFE SAVING
NEW SOUTH WALES

01

Business Case

Why DIAB capability is critical for emergency services

Operational drivers and gaps in current systems

Regulatory and industry context

SURF LIFE SAVING
NEW SOUTH WALES

BUSINESS CASE

Operational Problem Statement

01 Frequent loss of terrestrial communications during disasters

02 Limited situational awareness in remote and off-grid environments

03 High dependency on fixed infrastructure

04 Need for rapid deployment and sustained operations

SURF LIFE SAVING NEW SOUTH WALES

BUSINESS CASE

Why Drone-in-a-Box?

01 Persistent aerial intelligence without on-site pilots

02 Rapid deployment via a trailerised solution

03 Supports long-duration missions

04 Enhances safety and operational decision-making

SURF LIFE SAVING
NEW SOUTH WALES

BUSINESS CASE

What Was Required

01 Fully off-grid capable system

02 Resilient, redundant communications

03 Integrated aviation awareness systems

04 Remote control of assets and sensors

05 Scalable and interoperable platform

SURF LIFE SAVING NEW SOUTH WALES

BUSINESS CASE

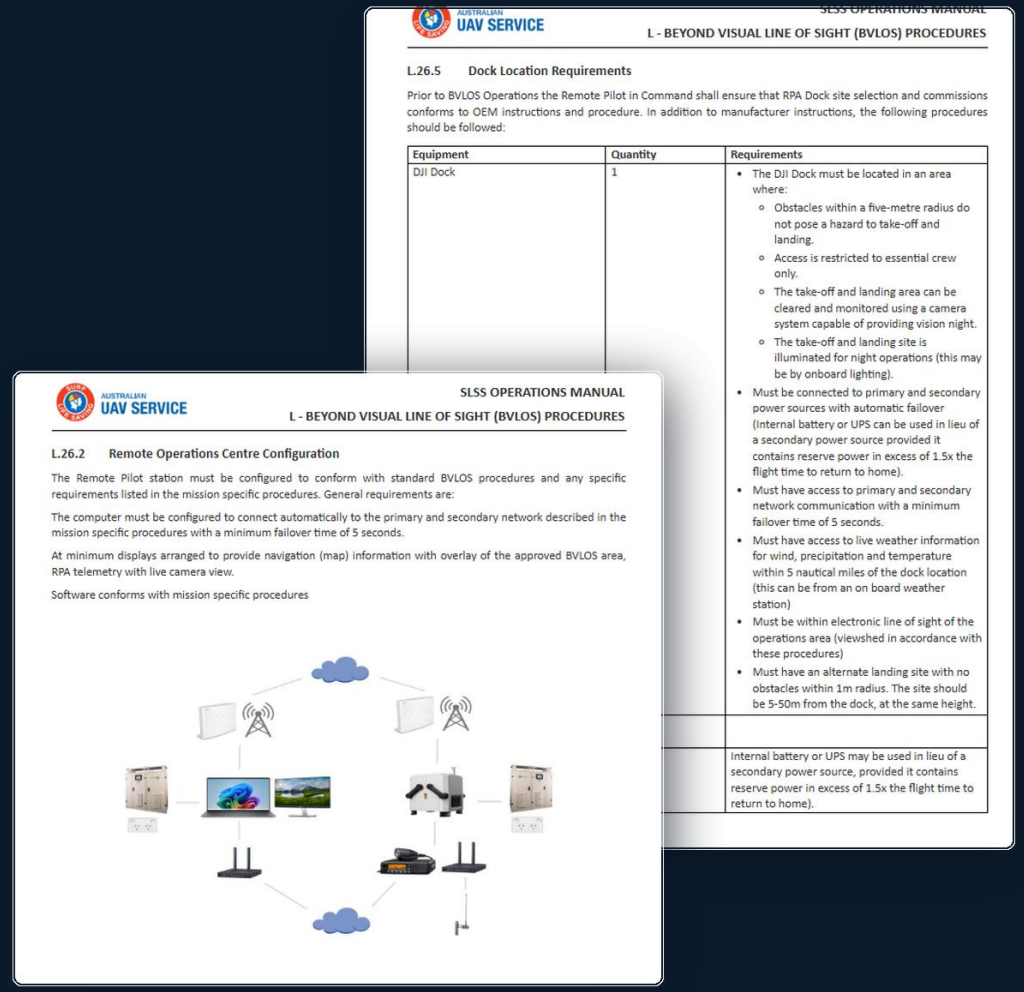
Regulatory Considerations (CASA)

01 Redundant communications links

02 Power system redundancy for sustained flight operations

03 Airspace awareness and collision avoidance

04 Compliance with BVLOS and automated operations frameworks



AUSTRALIAN UAV SERVICE

SLSS OPERATIONS MANUAL

L - BEYOND VISUAL LINE OF SIGHT (BVLOS) PROCEDURES

L.26.5 Dock Location Requirements

Prior to BVLOS Operations the Remote Pilot in Command shall ensure that RPA Dock site selection and commissions conforms to OEM instructions and procedure. In addition to manufacturer instructions, the following procedures should be followed:

Equipment	Quantity	Requirements
DJI Dock	1	• The DJI Dock must be located in an area where: ◦ Obstacles within a five-metre radius do not pose a hazard to take-off and landing. ◦ Access is restricted to essential crew only. ◦ The take-off and landing area can be cleared and monitored using a camera system capable of providing vision night. ◦ The take-off and landing site is illuminated for night operations (this may be by onboard lighting). • Must be connected to primary and secondary power sources with automatic failover (Internal battery or UPS can be used in lieu of a secondary power source provided it contains reserve power in excess of 1.5x the flight time to return to home). • Must have access to primary and secondary network communication with a minimum failover time of 5 seconds. • Must have access to live weather information for wind, precipitation and temperature within 5 nautical miles of the dock location (this can be from an on board weather station) • Must be within electronic line of sight of the operations area (viewshed in accordance with these procedures) • Must have an alternate landing site with no obstacles within 1m radius. The site should be 5-50m from the dock, at the same height.
		Internal battery or UPS may be used in lieu of a secondary power source, provided it contains reserve power in excess of 1.5x the flight time to return to home).

AUSTRALIAN UAV SERVICE

SLSS OPERATIONS MANUAL

L - BEYOND VISUAL LINE OF SIGHT (BVLOS) PROCEDURES

L.26.2 Remote Operations Centre Configuration

The Remote Pilot station must be configured to conform with standard BVLOS procedures and any specific requirements listed in the mission specific procedures. General requirements are:

The computer must be configured to connect automatically to the primary and secondary network described in the mission specific procedures with a minimum failover time of 5 seconds.

At minimum displays arranged to provide navigation (map) information with overlay of the approved BVLOS area, RPA telemetry with live camera view.

Software conforms with mission specific procedures

SURF LIFE SAVING NEW SOUTH WALES

BUSINESS CASE

Industry First Capability

01 First emergency service dual Drone-in-a-Box trailer solution

02 Designed for statewide deployment across NSW

03 Combines aviation, comms and IoT in one platform

04 Built in collaboration with industry partner Hypha

SURF LIFE SAVING
NEW SOUTH WALES

BUSINESS CASE

Business Value & Outcomes

01 Increased operational resilience

02 Improved response times in disasters

03 Enhanced situational awareness

04 Reduced reliance on damaged infrastructure

05 Future-ready scalable architecture

SURF LIFE SAVING NEW SOUTH WALES

02

Technical Integration

End-to-end architecture and system integration

Focus on communications resilience and control systems

SURF LIFE SAVING
NEW SOUTH WALES

TECHNICAL INTEGRATION

System Architecture Overview

01

Deployable Trailer-Based Platform

Fully self-contained, rapid deployment for incident and event environments

02

Integrated DIAB Ecosystem

Communications, power and compute integrated in a single platform

03

Edge Compute with Centralised Control

Local processing for resilience, with remote monitoring and command

04

Interoperable by Design

Built to integrate with ESO systems and partner agency platforms

SURF LIFE SAVING
NEW SOUTH WALES

TECHNICAL INTEGRATION

Connectivity Architecture

01 Resilient LEO Satellite Backbone

Dual bonded Starlink terminals for redundant, high-availability connectivity

02 Hybrid Terrestrial Integration

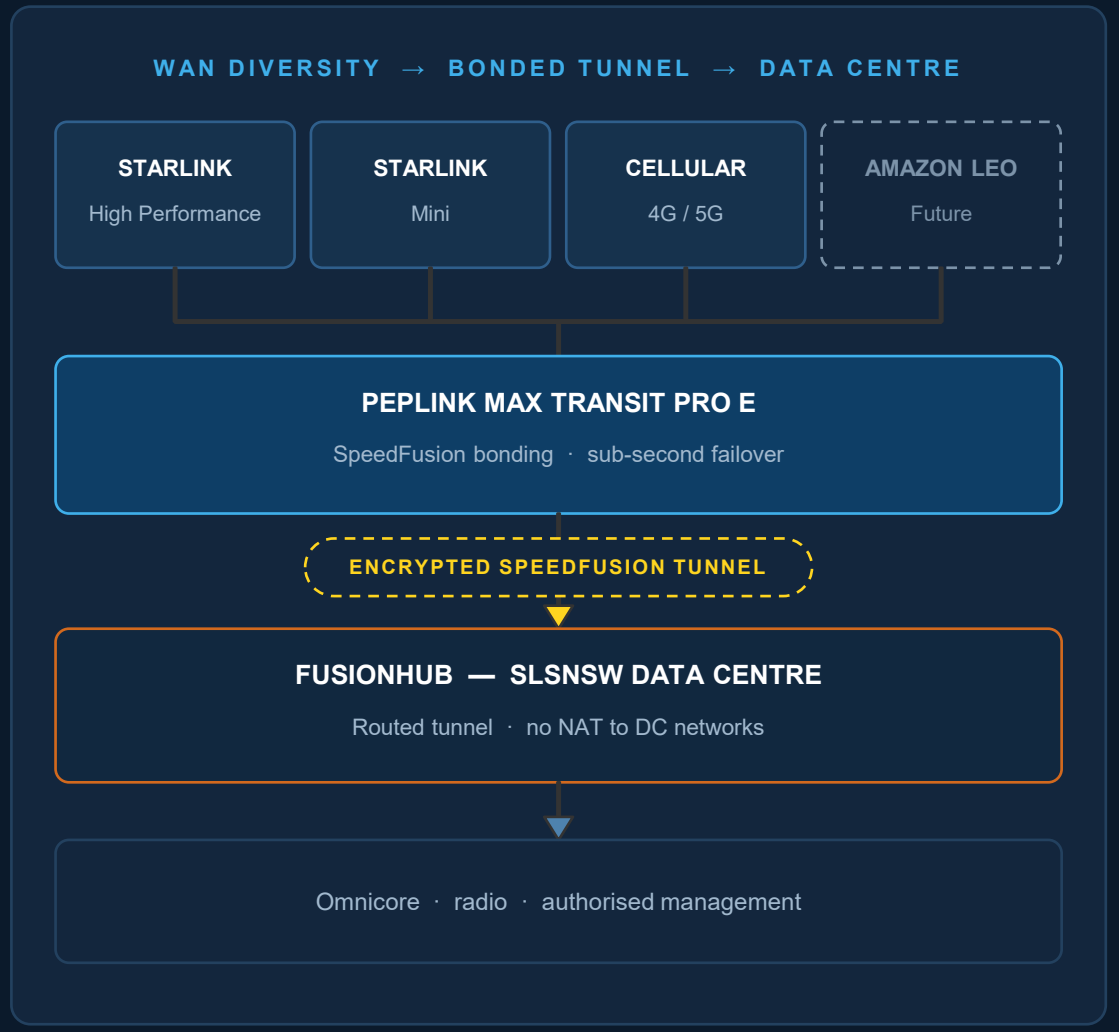
5G links enhance performance and hold coverage where available, on LEO failure

03 Seamless Link Failover

Automatic switching between satellite and cellular keeps operations uninterrupted

04 Future-Ready Expansion

Designed for integration with emerging LEO networks (e.g. Amazon LEO)



Illustrative — WAN mix and hub placement per site design.

SURF LIFE SAVING NEW SOUTH WALES

TECHNICAL INTEGRATION

Omnitronics Integration

01 **Omnicore as Central Control Layer**

Primary interface for system control and operational management

02 **Integrated Radio Communications (Airband)**

Control and monitoring of aviation and radio channels

03 **Platform-Based I/O Control**

Hardware and system I/O managed through the Omnitronics ecosystem

04 **Unified Operator Interface**

Single pane of glass for comms, control and asset visibility

OMNICORE OPERATOR INTERFACE

Airband channel control across UAV Sled, Trailer 1 and Trailer 2 — a single pane of glass for voice, control and asset visibility.

SURF LIFE SAVING NEW SOUTH WALES

TECHNICAL INTEGRATION

I/O & Remote Asset Control

01 Centralised Control via Omnicore

Floodlighting and field systems managed from a single interface

02 Integrated IoT Device Ecosystem

Sensors and smart field devices connect seamlessly

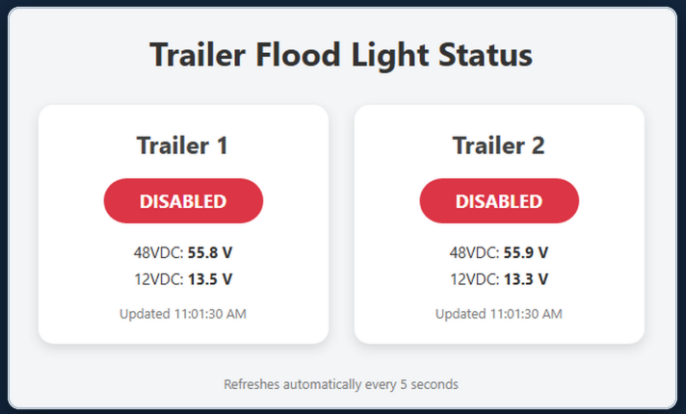
03 Remote Operation & Monitoring

Real-time control, status visibility and alerting from anywhere

04 Scalable Field Integration

Easily expandable to support additional assets and devices

REMOTE I/O — TRAILER FLOOD LIGHTING



Flood-light state and 48 V / 12 V rail voltages per trailer, refreshed every 5 s.

SURF LIFE SAVING NEW SOUTH WALES

TECHNICAL INTEGRATION

Aviation Awareness Systems

01

Integrated Airband Communications

Direct monitoring and control of aviation radio channels

02

Real-Time Aircraft Tracking (ADS-B)

Live visibility of aircraft movements in the operational area

03

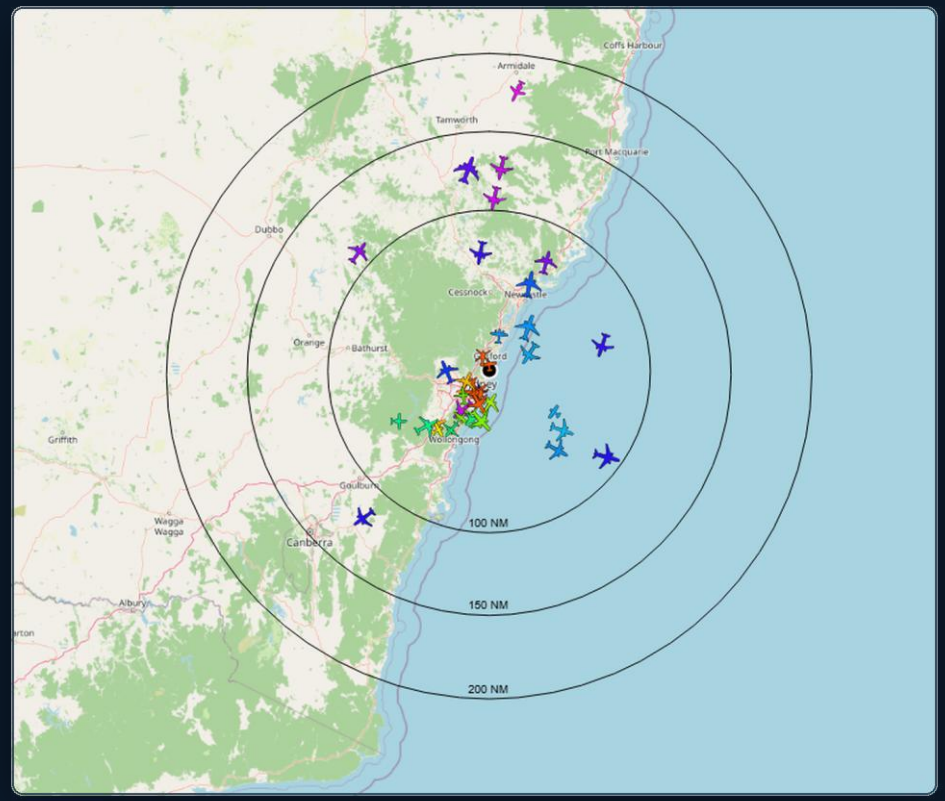
Enhanced Situational Awareness

Better decisions through integrated airspace intelligence

04

Supports Safe Drone Operations

Enables deconfliction and safe UAV operations in shared airspace



Live ADS-B picture — aircraft movements within the operational area.

SURF LIFE SAVING NEW SOUTH WALES

TECHNICAL INTEGRATION

Power & Autonomy

01 **Off-Grid Power Capability**

Fully self-sufficient, no external power source required

02 **Redundant Power Architecture**

Multiple power sources ensuring continuous operation

03 **Sustained Deployment Endurance**

Designed to support extended operations in the field

04 **Optimised for Remote Environments**

Reliable performance in isolated, low-infrastructure locations

SURF LIFE SAVING
NEW SOUTH WALES

TECHNICAL INTEGRATION

Real-World Deployment Considerations

01 **Rapid Deployment & Mobility**

Efficient transport and fast setup in dynamic environments

02 **Environmental Resilience**

Built to operate in harsh conditions — heat, weather, coastal exposure

03 **Variable Network Conditions**

Performance adapts to fluctuating connectivity environments

04 **Operational Readiness**

Requires clear procedures, training and integration into workflows

SURF LIFE SAVING NEW SOUTH WALES

TECHNICAL INTEGRATION

Future Roadmap

01 **Next-Gen LEO Integration**

Additional satellite networks (e.g. Amazon LEO) as they mature

02 **Expanded IoT Ecosystem**

A broader range of connected field devices and sensors

03 **Automation & AI-Enabled Operations**

Intelligent systems to enhance decision-making and efficiency

04 **Cross-Agency Adoption**

Scaling across emergency services and partner organisations

05 **New Dock Solutions**

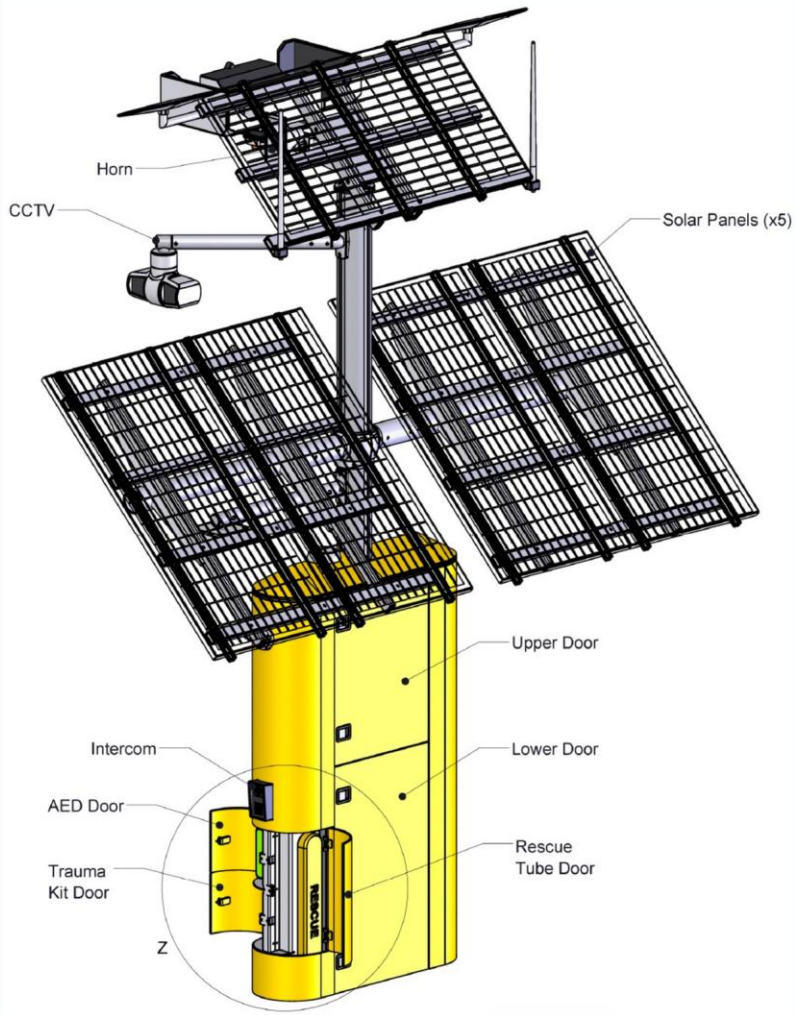
Docks from other companies, and new DJI designs and versions

06 **Similar Systems**

Other solutions using similar designs (e.g. SLS NSW Smart Poles)

SURF LIFE SAVING NEW SOUTH WALES

SIMILAR SYSTEM — 6 m SOLAR UAV ERB



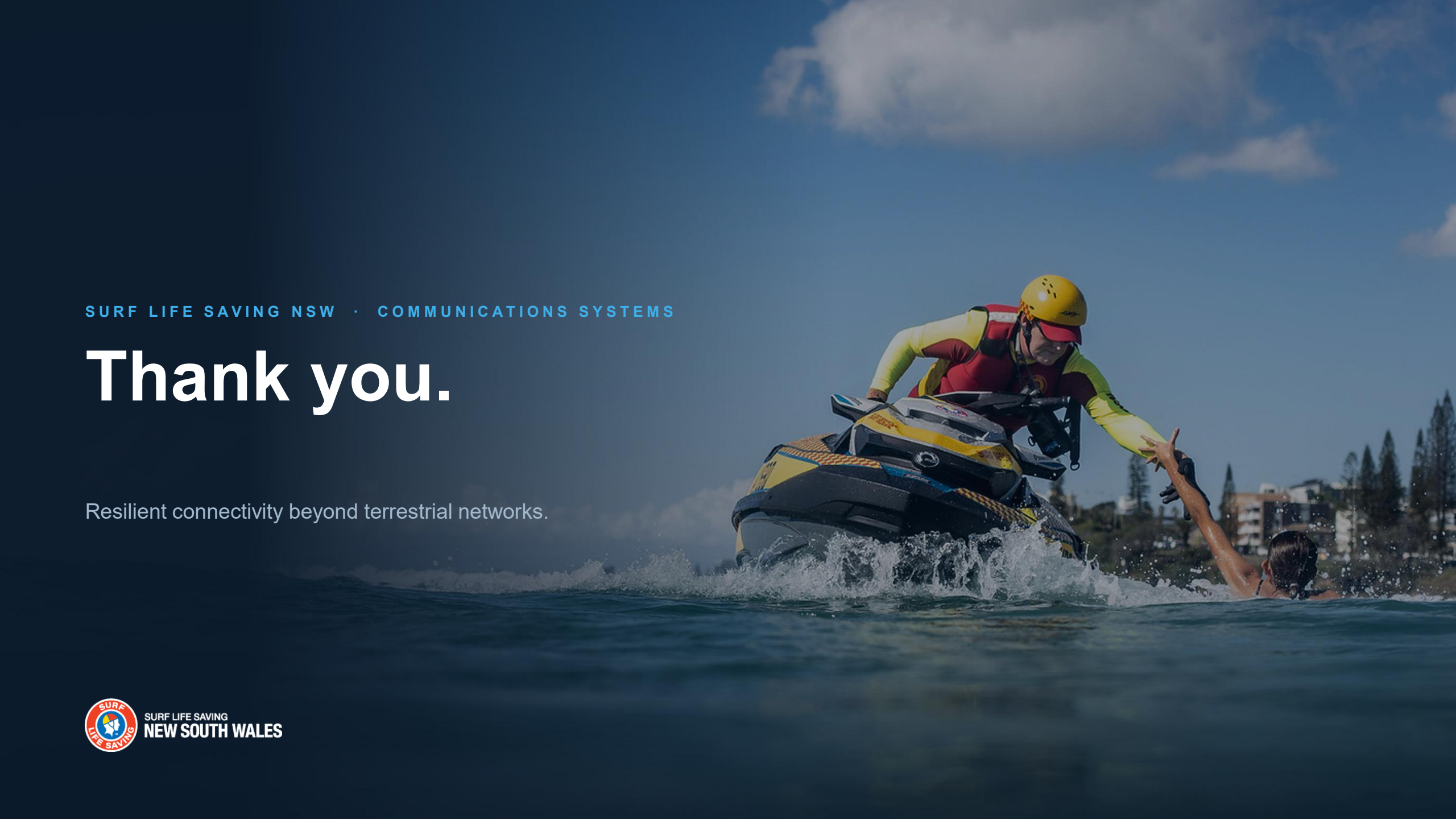
AIS / SLS NSW · UAV ERB rev D · isometric, not to scale

Fixed 6 m solar pole carrying the same dock, LEO and routing stack as the trailer.

SURF LIFE SAVING NSW · COMMUNICATIONS SYSTEMS

Thank you.

Resilient connectivity beyond terrestrial networks.



SURF LIFE SAVING
NEW SOUTH WALES