



Safe Integration of Remotely Piloted Aircraft Systems Into Civil Airspace

Dale McErlean
Operations Director: Ntsu Aviation Solutions and AfricaUSC



INTRODUCTION: Dale McErlean

Operations Director, Ntsu Aviation Solutions



Qualifications:

- BCom Aviation Management (University of Pretoria)
- Frozen ATPL – fixed wing

Aviation Experience:

- Turn-around Co-Ordinator (Virgin Atlantic) – 5 years
- Commercial Charter pilot – 4 years
- Flight operations inspector (Part 101) – 3 years
 - Actively involved in the implementation of Part 101
 - Accreditation of RPAS operators and the issuing of RPAS Operators Certificates

Attended ICAO RPAS Panel meetings, JARUS meetings and the S-UAS Advisory Group

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Career Achievements:

- Nominated as an Honoree in the Global Woman to Watch in UAS 2018, category: Airspace Integration
- Selected by FORBES WOMAN AFRICA as part of their first of its kind list, THE NEW WEALTH CREATORS. The list looks at exceptional innovative female entrepreneurs on the African continent running a business or social enterprise using unconventional methods. The list comprises of 20 women who have created significant impact in their respective sectors

NTSU AVIATION SOLUTIONS



As passionate ambassadors of the Remotely Piloted Aircraft Systems (RPAS) community and zealous individuals who strive to harmonise the co-existence of RPAS and conventional aviation systems and equitable use of airspace and resources, **Sam Twala** and **Dale McErlean** co-founded NTSU AVIATION SOLUTIONS (PTY) LTD.



Ms Dale McErlean
OPERATIONS DIRECTOR



Mr. Sam Twala
TECHNICAL DIRECTOR

NTSU AVIATION SOLUTIONS



- An aviation company specializing in the Remotely Piloted Aircraft Systems (RPAS) industry

- OUR VISION:

To be the safety ambassadors of the RPAS industry by consistently and innovatively delivering professional and cost-effective solutions to the industry at large

- OUR MISSION:

To harmonise the co-existence of RPAS systems and conventional aviation by enabling the equitable use of airspace and resources

- **SAFE – COMPLIANT - EFFICIENT**

OUR SISTER COMPANY: AfricaUSC, South Africa



info@africausc.co.za
www.africausc.co.za

- Training and Education
- RPAS Regulations Development
- Inspectorate Training
- Enhanced Radio Telephony

Some of our training courses;

- UAS Training – Fundamentals
- UAS Workshop – Executive level
- CAR Part 101 and CATS 101
- Operational and System Safety Risk Assessment
- RPAS Maintenance Technician
- Specific Operations Risk Assessment

Our big brothers

- EuroUSC Benelux
- EuroUSC Spain
- EuroUSC Italia

OUR SISTER COMPANY: AfricaUSC, South Africa



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UPCOMING.....

**UNMANNED AIRCRAFT SYSTEMS
COURSE**

22 – 26 JULY 2019

Midrand Conference Centre

OUR SISTER COMPANY: AfricaUSC, South Africa



COURSE CONTENT

- ICAO and JARUS latest developments
- Specific Operations Risk Assessment (SORA) - JARUS
- Newly introduced EU Basic Regulation 1139/2018 - EASA rulemaking responsibility extended to small civil UAS of any mass
- Implementation of rules for UAS operations based on three categories (open, specific and certified) by the EU states - voted by the EU States on 28 Feb 2018
- Delegated Rules obliging manufacturers and importers (e.g. from China) to put the Type Approval mark (CE) on the small UAS and to sign a declaration of conformity with emerging ISO standards - adopted by European Commission on 12 March 2018.

RPAS: Remotely Piloted Aircraft System



- WHAT is a RPAS?
An unmanned aircraft piloted from a remote pilot station and all associated elements, including the required command and control links, required at any point during flight operation
- Civil Aviation Regulations
Part 101 was promulgated on 1 July 2015 – regulations and technical standards governing the operation of remotely piloted aircraft in South Africa

Applicable to commercial, corporate, non-profit and private operators

GLOBAL FIGURES



- The global market in drone-powered solutions for the power and utilities industries is worth as much as USD 9.46 billion a year (PwC, 2017)
- Over 76,000 drones could be in the UK skies in 12 years' time with potential to increase UK GDP by £42 billion (or 2%) by 2030 (PwC, 2018)
- Amazon is anticipating 80 to 90% of their shipments will be done with drones in the future
- Drone deliveries and smart distribution tech are already reducing a three-day delivery time to three hours (BUSINESSTECH, 2018)

SAFE INTEGRATION: CASE STUDY – CAPE TOWN



SAFE INTEGRATION: CASE STUDY – CAPE TOWN



SAFETY CONSIDERATIONS AND SITE ESTABLISHMENT

- Letter of Procedure in place with FACT ATC
- Transponder installed on aircraft
- Notifications/meetings with other airspace users, eg: emergency medical services and the SAPS
- Senior flight crew allocated to the project
- Frequent risk assessments completed
- Operational area:
 - suitable take off and landing area
 - security considerations of flight crew
- Technical considerations on the aircraft
- Pre-programmed flight paths

SAFE INTEGRATION: CASE STUDY – CAPE TOWN



SUCCESSSES

- 38 730kms
- 880 hours
- 28 arrests

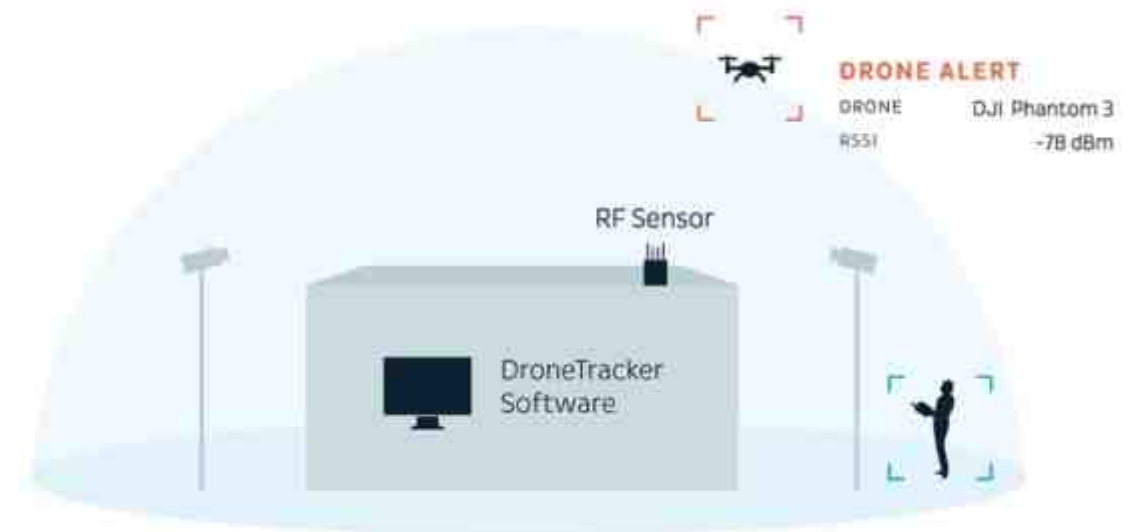
CHALLENGES

- Initially: Radio interference
- Weather: high winds, mist, fog, rain
- Moisture content: blocked pitot tubes, rusting equipment
- Site identification – suitability for aircraft, proximity to flight area and security of flight crew members

DRONE AWARENESS TECHNOLOGY



- STOP UNAUTHORIZED DRONES:
 - Modern security requires a layered approach that keeps up with the evolution of drone technology
- DETECT A DRONE AND FIND THE PILOT
 - RF localization technology enables users to find the location of the pilot and drone
 - Termination of the threat is therefore more achievable
- UNCOVER DRONES IN YOUR AREA
 - Alerts of potential threats even before they take off



DISCOVER SUSPICIOUS DRONE ACTIVITY IN YOUR AREA

CQNet: Flight Management System



The Drone logbook and management system that enables safer more scalable operations and ensures compliance.

Show real time drone operations

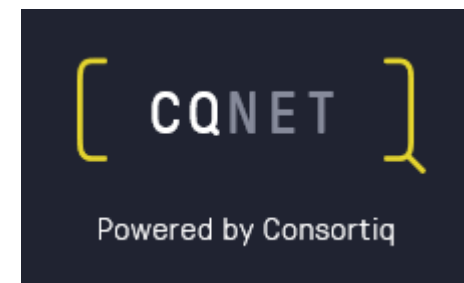
Plan, record and maintain your Drone. Select from different templates to keep your maintenance and checklists all in one place.

Plan your mission in one simple interface. Assign crew, aircraft, and carry out your operational flight checks.

Pick from manufacturer recommended schedules and add your own maintenance plans whilst managing your current repairs and future scheduled work.

Check weather, flight restrictions and current airspace details in your area.

With live sync, mission details are updated on pilot devices in real-time. The app working as the pilot's assistant, allowing the pilot to focus on the flight in hand.



WHAT DO WE NEED....



- AIR MOBILITY SOLUTIONS
 - Investors
 - Regulators – comprehensive guidelines for equipment and airspace management
 - Industry – educate the public and address core concerns, eg: Safety
- INFRASTRUCTURE
 - Air Traffic Management Systems
 - “Drone-ports”: take off and landing areas for drones
 - Supporting technology infrastructure, eg: automatic doors for admitting drones into warehouses
- DRONE AWARENESS TECHNOLOGY: Protection from drones with ill-intentions
- FLIGHT MANAGEMENT SYSTEMS

Systems need to be interoperable and communicate with each other

CONCLUSION



DYNAMIC and DISRUPTIVE... unmanned aircraft systems have numerous challenges and benefits.
The industry is accelerating at a rapid pace.....

THE SAFE INTEGRATION OF RPAS INTO CIVIL AIRSPACE IS POSSIBLE...

- Collaborative effort from all relevant role players
 - Research and development
 - Proof of concepts / test cases
 - Education and awareness

“The rapid growth of the unmanned aircraft systems industry is reshaping our future by expanding business markets, providing consumers with innovative solutions and even saving lives”

Brian Wynne, CEO of AUVSI

THANK YOU

