The Human Factors and Aviation Safety Research Laboratory (HF laboratory) at UNSW is a purpose-built research facility designed to provide leading researchers the tools and resources to improve understanding of how humans function within the workplace (i.e., aircraft, cars, trains, offices, hospitals, etc).

**Competitive Advantage**

- The HF laboratory has state-of-the-art hardware to accurately reproduce operational environments to study human performance.
- Expertise in the area of human performance and cognition including perception, attention; memory and decision-making.
- Expertise in understanding how stressors and external influences impact cognition and performance.
- Expertise in understanding how humans function within a system under competing demands and pressures.
- Expertise in system design and processes to maximise human performance.

**Impact**

- Detailed understanding of human performance and the impact of certain factors on behaviour (Unmanned Aerial Vehicles in Surf Life Saving – Surf Life Saving NSW)
- Improved human performance
- Reduction in errors (Human Factors in Medicine – Clinical Excellence Commission)
- Improved efficiency
- Improved system design (Low Level Airspace Management Plan – AirServices Australia; VTC Charts in 3D for RPAS Operators – Civil Aviation Safety Authority)
- Improved workplace safety (Pilot Psychology – Australian Federation of Air Pilots)

**Successful applications**

The HF laboratory allows for research that leads to:

- Improvements in pilot risk management (decision-making under uncertainty)
- Advances in training methods designed to reduce risk-taking behaviour of pilots
- Understanding the effect of aircraft noise on pilot decision-making, including the effect of noise on memory, attention and perception
- Design of training programmes to reduce young drivers’ speeding behaviour
- Improved understanding of the factors that result in miscommunication with pilots
- Design of features to improve the effect of the pre-flight safety briefing for commercial airline passengers
- Understanding factors that affect pilot psychological health and wellbeing
- Understanding the effect of workload and noise of RPAS operator performance.

**Capabilities and resources**

- Instrumentation (wireless) for state-of-the-art physiological measures - Eye tracking, EEG, skin conductance (suitable for use in the
• Aircraft - Diamond DA40 (single engine), Piper PA44 (twin engine)
• Flight Simulators and Procedure Trainers - Frasca (Diamond DA40) flight simulator, Pacific Simulators 4.5 Multi-Crew Trainer (B737), Aerosim Q400 Virtual Procedure Trainer, Precision Flight Controls Flight Trainer
• Instrumented Vehicle – Mitsubishi ASX
• Driving Simulators – STISIM Drive, FORUM8
• Remotely Piloted Aircraft Systems – DJI Phantom 4 Pro with multispectral camera, DJI Mavic with thermal camera, DJI Matrice 210, Parrot Disco fixed wing.