A NEW APPROACH TO RISK MANAGEMENT
Safe integration of RPAS into civil airspace and civil operations

FURTHER EXCELLENCE

WHEN YOU NEED TO BE SURE
With unprecedented growth rates in the civilian RPAS industry, the demand and supply dynamics have been compared to the initial chaos of the automobile boom of the 1920’s (Hobbs and Herwitz 2006). A robust approach to safety & risk management RPAS is required to integrate RPAS into civil airspace.
High Risk Classification

- Fire Fighting Operations
- First response and reconnaissance missions
- Search and rescue
- Power line surveys
- Hot stack inspections (off shore and on shore)
- Building and structure and equipment inspections
- Surveillance and data collection
- Confined areas
- Operations in and around CTA, ALA, HLS

*Potential for damage to stakeholder equipment, delivery, assets or personnel.*
What are the risks?

- Equipment damage
- Collision (CPA/RPA/RPA)
- Plant shutdown
- Supply interruption
- Lost data
- Injury or death
- Loss of RPA
- Corporate image
- Liability
- Increased costs
- Environmental damage
- Regulatory infraction
UAV flight presents human factors challenges different from and in some ways greater than those of manned aircraft (Gawron 2008).
UNIQUE FACTORS EFFECTING RPAS OPERATIONAL SAFETY

- Lack of shared fate (survival instinct, resilience)
- Complacency
- Boredom
- Distraction
- Resignation
- Disposability
- Curiosity
- Disposability
- Accessibility
- Accountability
CONTRIBUTING FACTORS IN RPA Mishaps

(TVARYANAS, THOMPSON, & CONSTABLE, 2006).

60.2% mishaps are due to human factors.
HUMAN FACTORS – INTEGRATED METHODOLOGY

- **HUMAN FACTORS**
  - Ergonomics
  - Physiology & biology
  - Human machine interface

- **CREW RESOURCE MANAGEMENT**
  - Teamwork
  - Work load dynamics
  - Authority leadership

- **NON TECHNICAL SKILLS**
  - Social skills
  - Communication
  - culture
Shared elements

- Communication
- Airmanship
- Situational awareness
- Decision making
- Workload
- Information processing
- Culture
- Fatigue
- Stress
ROBUST APPROACH TO RISK MANAGEMENT

- **ALARP** - As Low As Reasonably Practical
- **SFAIRP** – So Far As Is Reasonably Practical

- **ALARP** utilises target levels of safety (TLS) as decision making benchmark
- Input based process
- If risk assessment is inaccurate (probability, High C low L) controls may not be implemented

- **SFAIRP** utilizes reasonable controls available to be put in place
- Focuses on precautions, controls mitigation earlier in the process
- Output based process
- SFAIRP is more robust in post event forensic analysis of due diligence
INTEGRATING HUMAN FACTORS INTO RPAS RISK MANAGEMENT STRATEGIES

- RPAS operations need a comprehensive risk matrix database
- Needs a proactive approach to controls
- Needs to be portable
- Safety assessments can be generated in minutes
- Linked to standards in the audit process

Interactive, Multi Dimensional Risk Factors, Controls & Treatments
PART OF A LIVING SAFETY MANAGEMENT SYSTEM

- Needs to be part of a Safety Management System
- Needs to track risk parameters
- Gauge affectivity of controls and mitigation strategies
- Needs to track best practice behaviours

**Risk Strips Selected**

- No Crew Resource Management, Threat & Error Training: 1.9%
- Battery Malfunction: 2.5%
- Control set/Computer malfunction: 2.4%
- Collision with persons on landing: 2.2%
- Engine failure Rotary wing: 2.2%
- Propeller strike on person: 2.3%
- Transport of Batteries: 2.8%
- Transport of RPA: 3.0%
- Sunglare: 2.4%
- Loss of control: 2.2%
- Fatigue: 2.4%
- Carrying / holding equipment: 2.3%
- Storage of Batteries: 2.6%
- Emergency Response Plan: 2.5%
- Aircraft loss of Link: 2.6%
- Turbulence / Gusty conditions: 2.1%
AUTOMATIC EVENT REGISTER

- Event tracking
- Assists component reliability
- Assists with continual improvement
- Assists in due diligence support material
ENSURE THE SAFETY OF YOUR AVIATION ACTIVITIES

SOLUTIONS FOR MANAGING AVIATION RISK

FURTHER EXCELLENCE

WHEN YOU NEED TO BE SURE

SGS