FLIGHT SAFETY FOUNDATION

independent • impartial • international

Basic Aviation Risk Standard

Contracted Aircraft Operations

ISASI – Wellington NZ

Jun 2017

Some of our BARS Members

Elimination of unnecessary multiple audits

Standardization of audits

Centralized quality assurance of the audit process

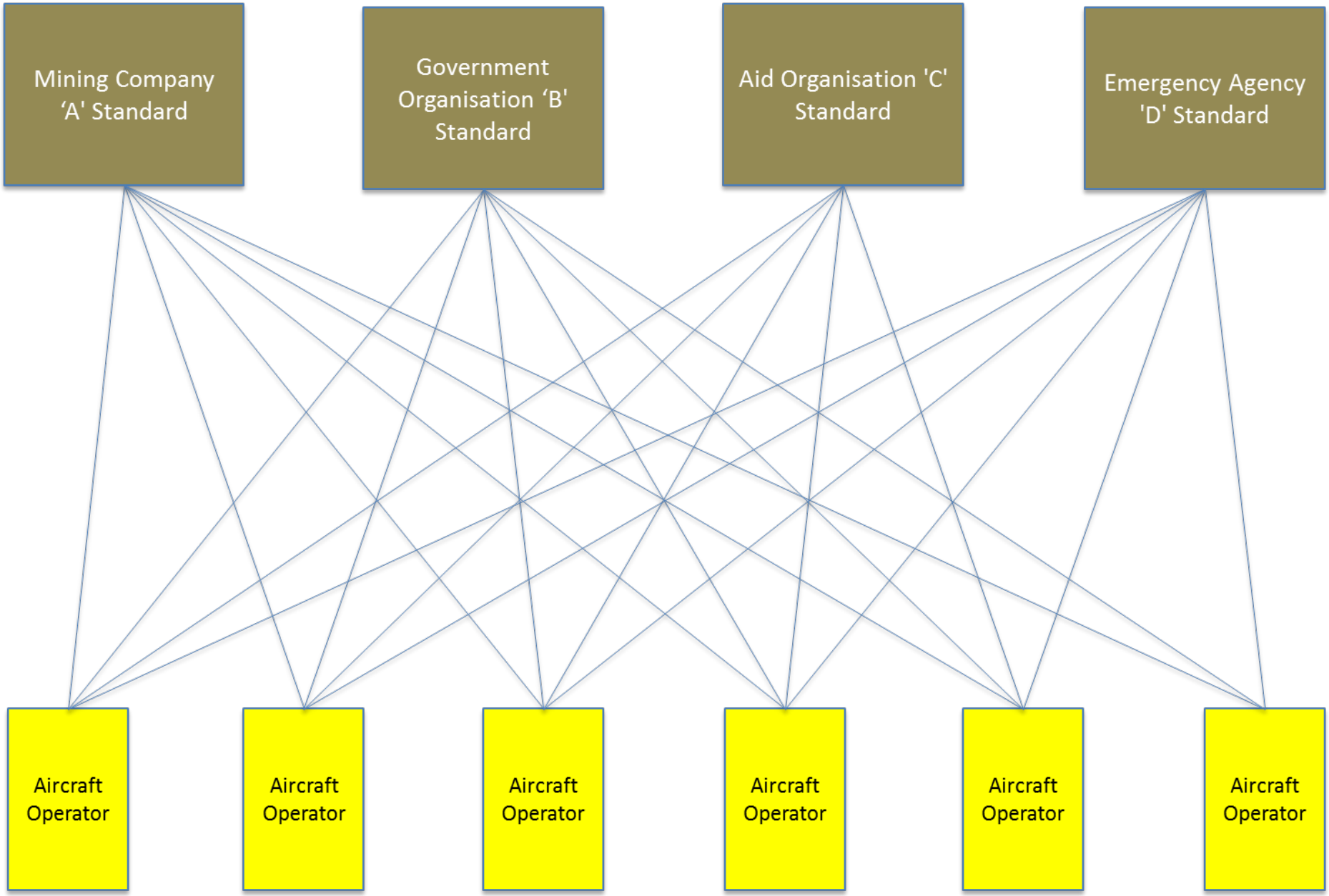
A mechanism to allow mutual acceptance of audit reports by companies in the sector

Cost efficiency

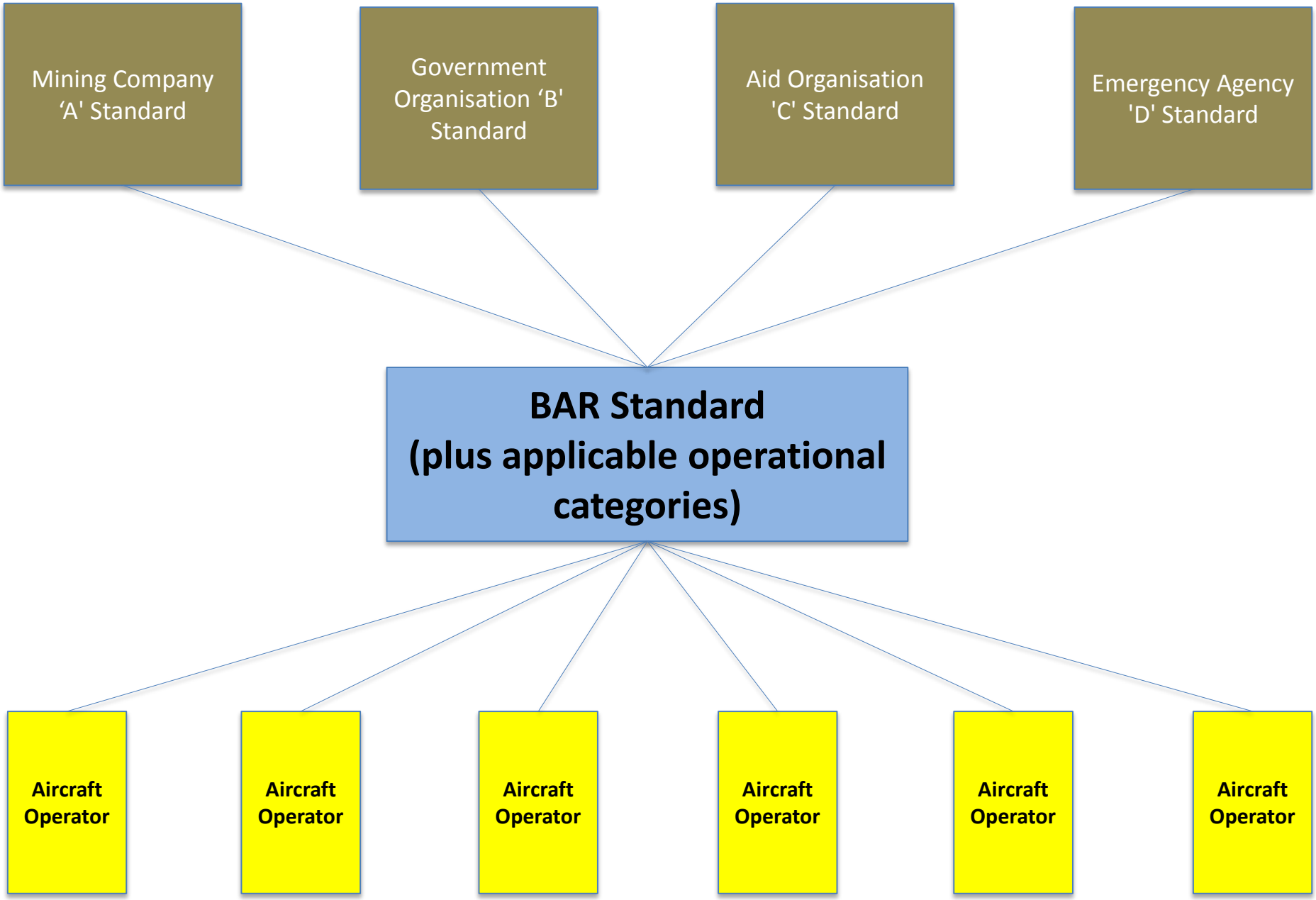
A centralized incident/accident database for the sector

A process to ensure that the industry standard reflects the evolution of the sector

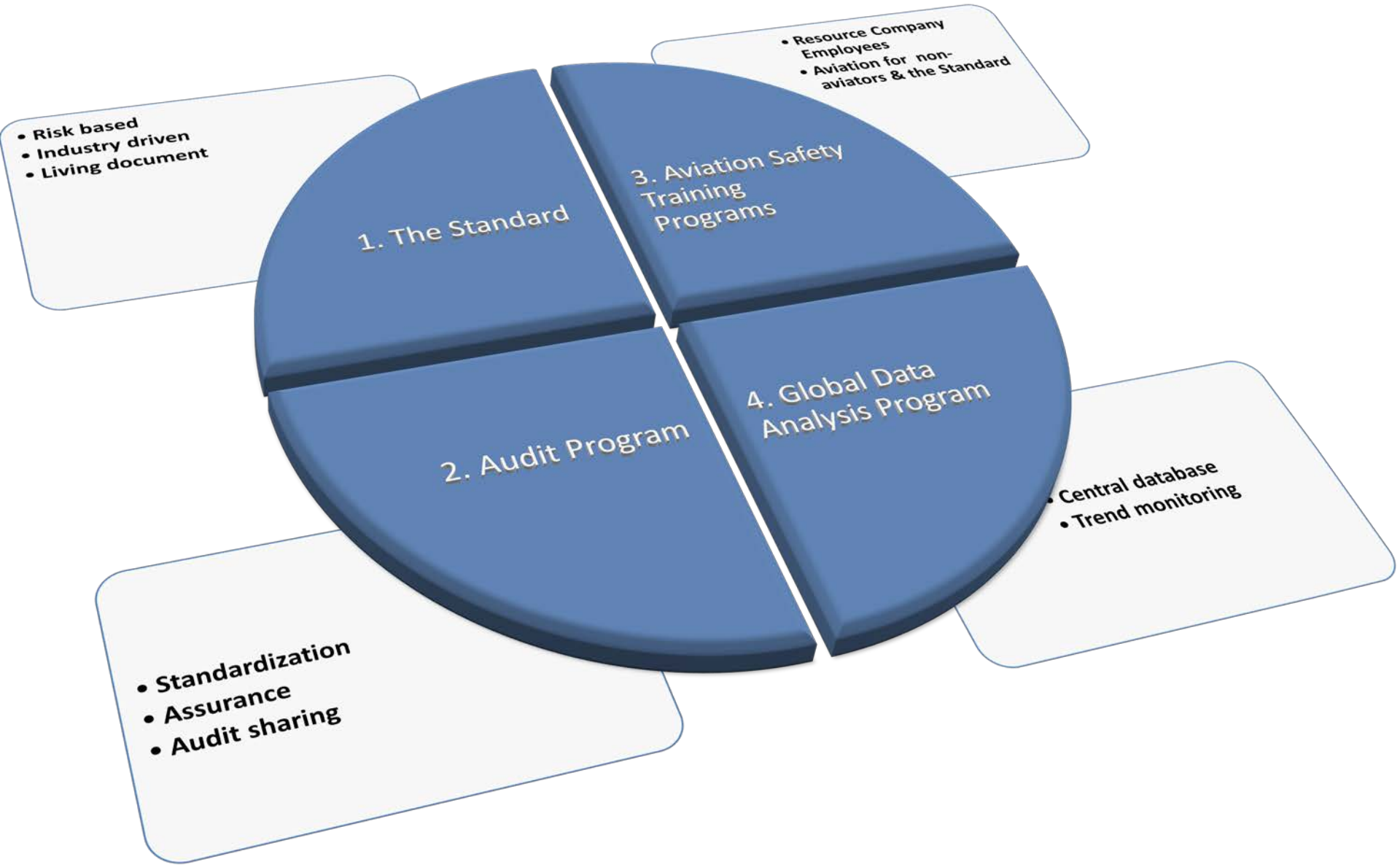
What Aviation End users sought



BARS – Reducing the Audit Burden



BARS – Reducing the Audit Burden



Components of the BARS Program

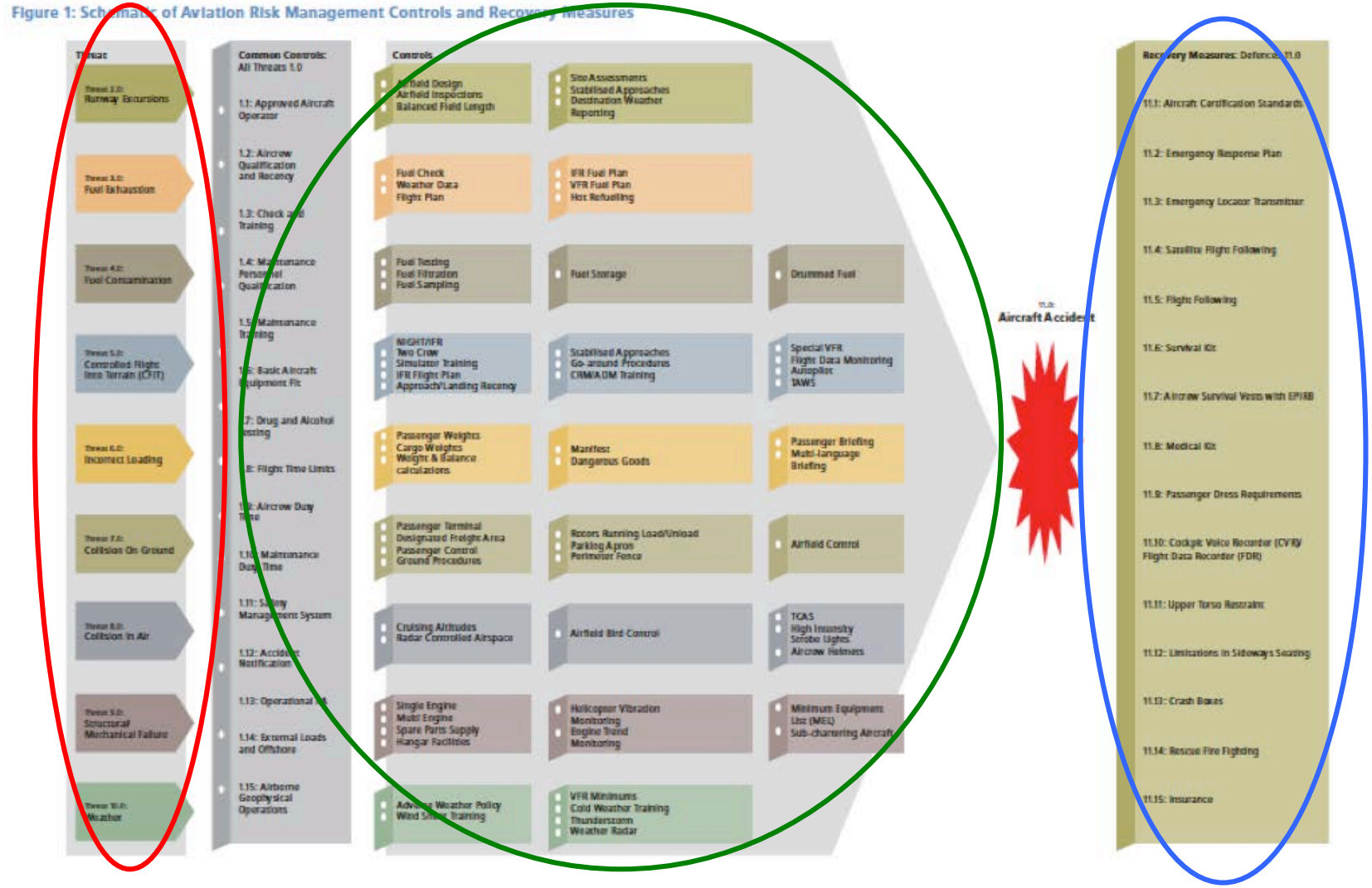


Figure 1: Schematic of Aviation Risk Management Controls and Recovery Measures
Threat
Runway Excursions
Fuel Exhaustion
Fuel Contamination
Controlled Flight Into Terrain (CFIT)
Incorrect Loading
Collision On Ground
Collision In Air
Structural/ Mechanical Failure
Weather
Common Controls: All Threats 1.0
1.1: Approved Aircraft Operator
1.2: Aircrew Qualification and Recency
1.3: Check and Training
1.4: Maintenance Personnel Qualification
1.5: Maintenance Training
1.6: Basic Aircraft Equipment Fit
1.7: Drug and Alcohol Testing
1.8: Flight Time Limits
1.9: Aircrew Duty Time
1.10: Maintenance Duty Time
1.11: Safety Management System
1.12: Accident Notification
1.13: Operational Control
1.14: External Loads and Offshore
1.15: Airborne Geophysical Operations
Controls
Airfield Design
Airfield Inspections
Balanced Field Length
Site Assessments
Stabilised Approaches
Destination Weather Reporting
Fuel Check
Weather Data
Flight Plan
IFR Fuel Plan
VFR Fuel Plan
Hot Refuelling
Fuel Testing
Fuel Filtration
Fuel Sampling
Fuel Storage
Drummed Fuel
NIGHT/IFR
Two Crew
Simulator Training
IFR Flight Plan
Approach/Landing Recency
Stabilised Approaches
Go-around Procedures
CRM/ADM Training
Special VFR
Flight Data Monitoring
Autopilot
TAWS
Passenger Weights
Cargo Weights
Weight & Balance calculations
Manifest
Dangerous Goods
Passenger Briefing
Multi-language Briefing
Passenger Terminal
Designated Freight Area
Passenger Control
Ground Procedures
Rotors Running Load/Unload
Parking Apron
Perimeter Fence
Airfield Control
Cruising Altitudes
Radar Controlled Airspace
Airfield Bird Control
TCAS
High Intensity Strobe Lights
Aircrew Helmets
Single Engine
Multi Engine
Spare Parts Supply
Hangar Facilities
Helicopter Vibration Monitoring
Engine Trend Monitoring
Minimum Equipment List (MEL)
Sub-chartering Aircraft
Adverse Weather Policy
Wind Shear Training
VFR Minimums
Cold Weather Training
Thunderstorm
Weather Radar
Aircraft Accident
Recovery Measures: Defences 11.0
11.1: Aircraft Certification Standards
11.2: Emergency Response Plan
11.3: Emergency Locator Transmitter
11.4: Satellite Flight Following
11.5: Flight Following
11.6: Survival Kit
11.7: Aircrew Survival Vests with EPIRB
11.8: Medical Kit
11.9: Passenger Dress Requirements
11.10: Cockpit Voice Recorder (CVFR)/ Flight Data Recorder (FDR)
11.11: Upper Torso Restraint
11.12: Limitations in Sideways Seating
11.13: Crash Boxes
11.14: Rescue Fire Fighting
11.15: Insurance

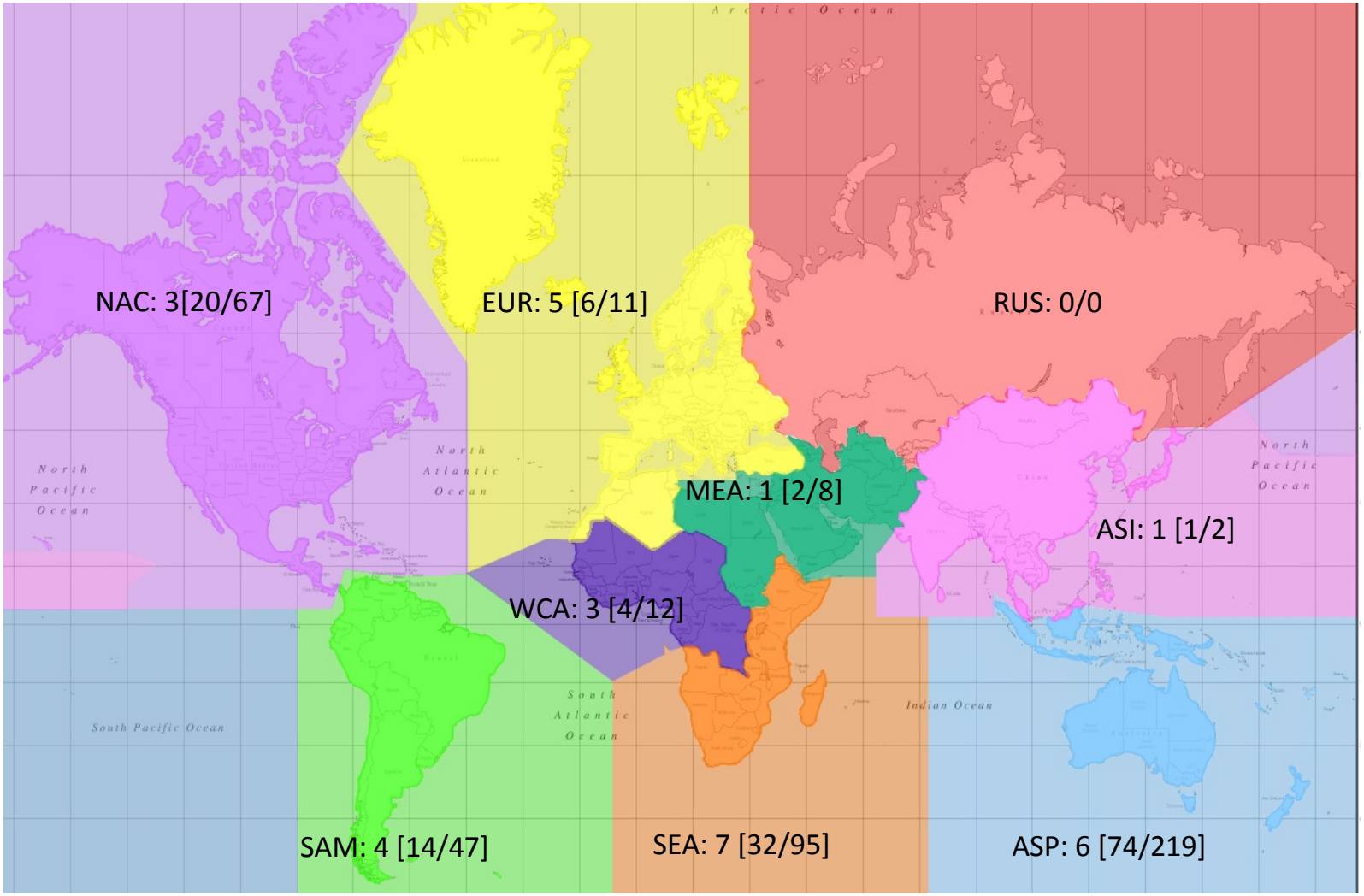
Aircraft Operator:
Demonstrates their ability to meet the requirements of the BAR Standard to the independent Audit Company.

Audit Companies:
Overseen by the BPO in their ability to meet the requirements of the BARS Program.

BARS Program Office (FSF):
Independent management of the Program,
Independent quality checking of auditing and audit report production.

Independent External Audit:
Independent evaluation of the BPO to deliver customer needs of the Program.

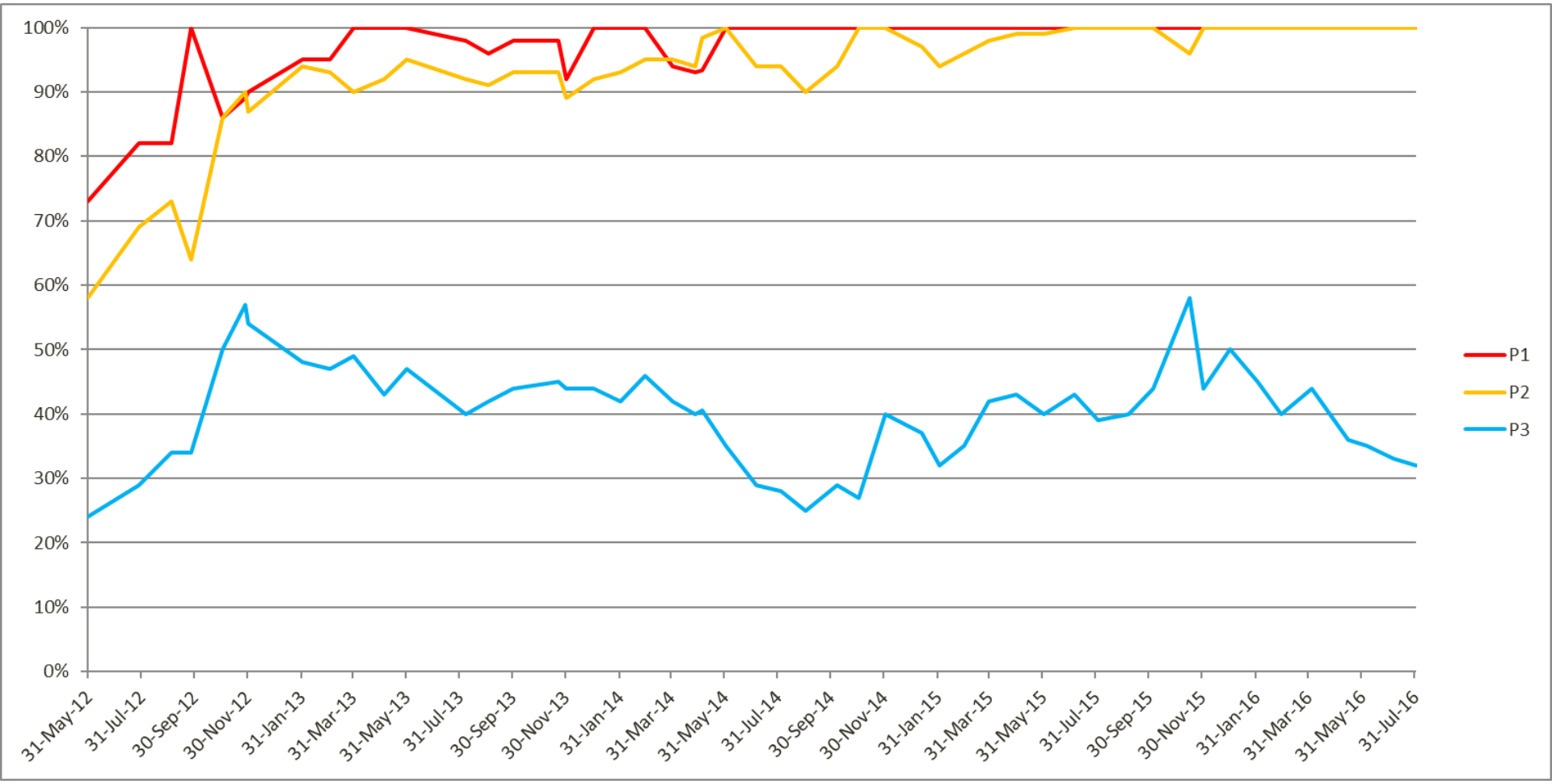
Program Assurance Model



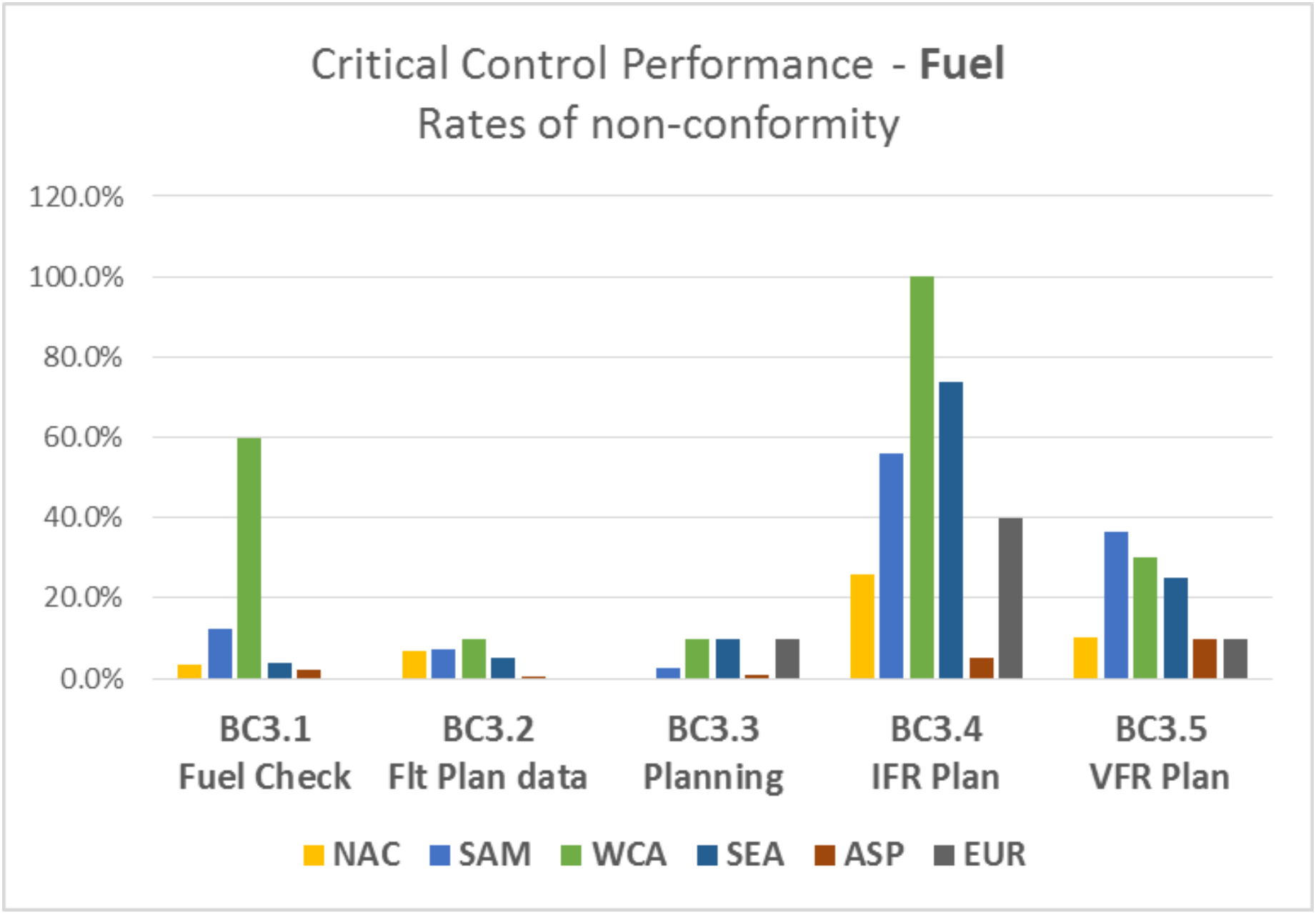
Geographic Spread
(Countries: [#Operators/#Audits])

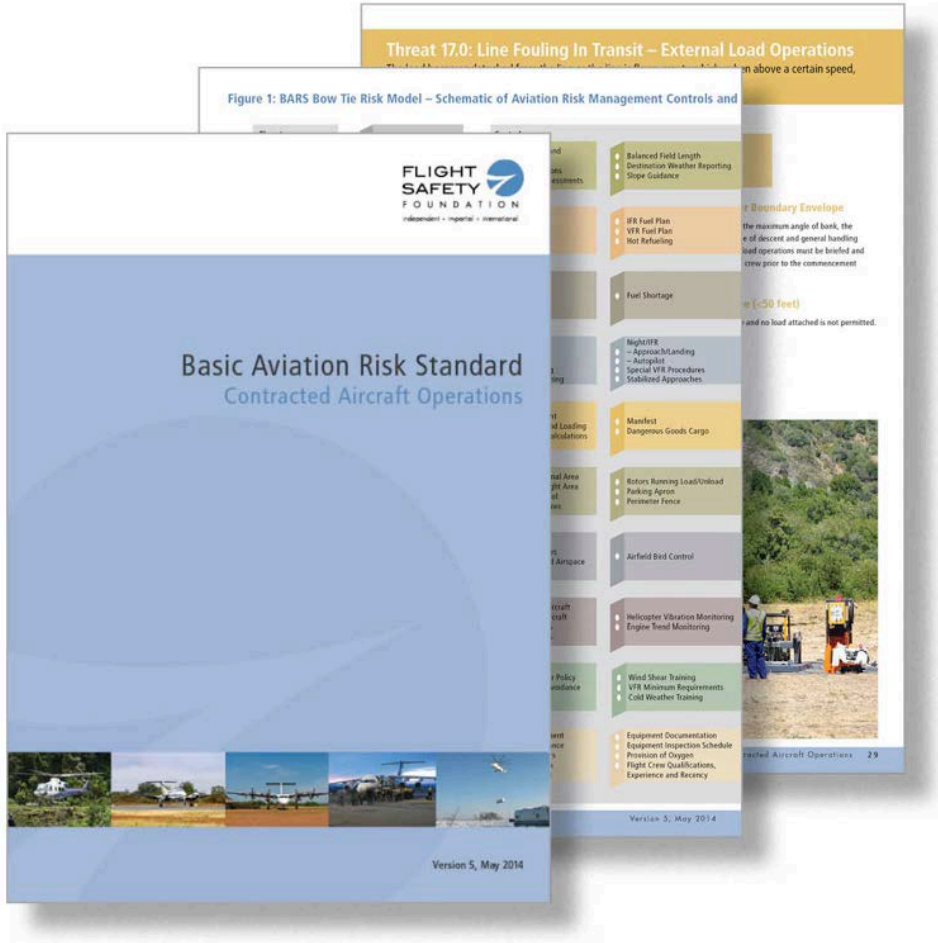
* As at 01 Apr 2017

BARS Geographic Performance

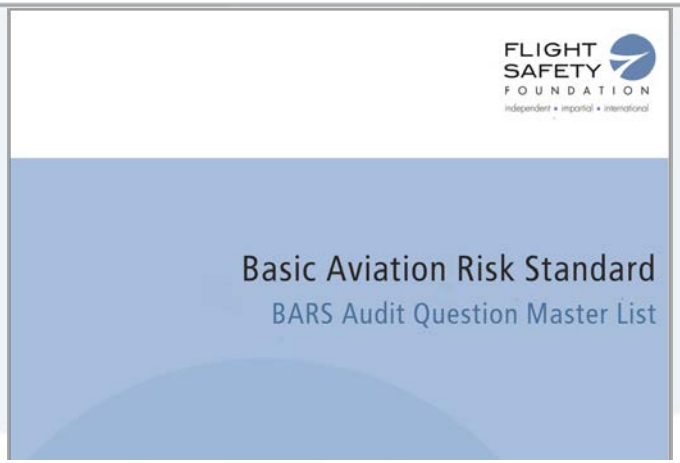


Close Out Rate Performance


Critical Control Performance - Fuel
Rates of non-conformity
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
BC3.1
Fuel Check
BC3.2
Flt Plan data
BC3.3
Planning
BC3.4
IFR Plan
BC3.5
VFR Plan
NAC
SAM
WCA
SEA
ASP
EUR


Threat 17.0: Line Fouling In Transit – External Load Operations
Figure 1: BARS Bow Tie Risk Model – Schematic of Aviation Risk Management Controls and
FLIGHT SAFETY FOUNDATION
Basic Aviation Risk Standard
Contracted Aircraft Operations
Version 5, May 2014


All survey operations are high-workload events. In order to share the workload, two crew
FLT 7.05.01
ORG 3.04.06
FLIGHT SAFETY FOUNDATION
Basic Aviation Risk Standard
Implementation Guidelines
Page 143
Version 5, May 2014



P	Ref	BARS Audit Question	Operational Categories	BAR Standard Mapping	ICAO/Source Mapping
P2	FLT 1.07.03	The Operator should ensure IFR fuel load calculations include fuel for start-up, taxi, en route, approach and transit to an alternate destination (if required). [BC3.4]	Std	3.4	A6 P1 4.3.6.3 A6 P3 S2 2.3.6.4
P2	FLT 1.07.04	The Operator should ensure IFR fuel load calculations include a variable reserve of 10% of total trip fuel. [BC3.4] A P2V is available for this question. See the latest P2V BARS Notification for further information.	Std	3.4	A6 P1 4.3.6.3 A6 P3 S2 2.3.6.3.1
P2	FLT 1.07.05	The Operator should ensure IFR fuel load calculations include 30 minutes fixed reserve. [BC3.4]	Std	3.4	A6 P1 4.3.6.3 A6 P3 S2 2.3.6.3.1
P2	FLT 1.07.06	The Operator should ensure the minimum fuel carried on any VFR flight plan meets the responsible regulatory authority requirements. [BC3.5]	Std	3.5	A6 P1 4.3.6.3 A6 P3 S2 2.3.6.2
P2	FLT 1.07.07	The Operator should ensure VFR fuel load calculations include a 30 minute fixed reserve and a variable reserve equal to 10% of trip fuel. [BC3.5] A P2V is available for this question. See the latest P2V BARS Notification for further information.	Std	3.5	A6 P1 4.3.6.3 A6 P3 S2 2.3.6.2
	FLT 1.08	**AIRCRAFT FUEL CHECKS**	Std		
P2	FLT 1.08.01	The Operator should have a procedure to ensure that fuel supplied to an aircraft is tested utilizing water detection capsules or equivalent. The PIC should ensure the quality of the fuel is acceptable for the operation of the aircraft. [BC4.1]	Std	4.1	

BARS Audit Questions

AVIATION SAFETY ALERT

AIRCRAFT ELT INSTALLATIONS

BARS BASIC AVIATION RISK STANDARD FLIGHT SAFETY FOUNDATION

1. Background

Date of Incident:	Various	**Aircraft Type:**	Various
Who this impacts:	All aircraft operators	**Operation Type:**	All aviation operations

2. Details

A number of Emergency Locator Transmitters (ELTs) have failed to transmit distress signals after an aircraft crash. Several of the accidents reviewed (both aeroplanes and helicopters) were supporting the resource sector. The absence of ELT signals to Search and Rescue (SAR) aircraft and satellite receivers resulted in the delayed discovery of the accident sites and rescue and recovery of personnel.

In most cases the ELT units were either displaced from the mounting (including detachment of the transmitting antenna), burnt out or shielded by wreckage preventing the ELT from performing to design standard. The intent of the ELT design is for the crash forces to automatically activate the transmitter which then transmits an emergency radio signal containing the identification and location of the accident aircraft to SAR organizations. These transmissions are a key component in the location and rescue of personnel once an accident has occurred.

In response to this issue, the US National Transportation Safety Board (NTSB) has previously provided the US Federal Aviation Administration (FAA) with Safety Recommendation A-10-169, requiring a detailed inspection of an aircraft's ELT to ensure it is mounted correctly and in accordance with manufacturer's specifications.

The recurring failure of the ELT as a critical control in mitigating the consequence of an aircraft accident means it is imperative that alternate mitigating controls (such as flight following) are considered and implemented.

3. Major Root Causes

In addition to ELT failure caused by crash forces greater than the design standard experienced in an accident, three other possible failure modes can be considered: (1) Incorrect installation of the ELT, (2) loosening of the ELT retention strap during normal operations; and (3) ELT unserviceable prior to the accident.

4. Recommendations

Contracted aviation service providers should be encouraged to:

- Ensure aircraft ELTs are mounted and retained in accordance with the manufacturer's specification (NTSB A-10-169) during annual inspection; and
- Review alternate controls associated with identifying downed aircraft such as satellite flight following or scheduled radio calls in accordance with Flight Safety Foundation BARS 12.4, 12.5 and 25.13.

Aviation Safety Alert Number 003

BARS Incident Alert 13-01

BARS BASIC AVIATION RISK STANDARD FLIGHT SAFETY FOUNDATION

Tropic Air C208 Caravan - Accident

1. Background

Date of Incident:	25 Nov 2013	**Location:**	Gulf Province Papua New Guinea
Aircraft Type:	C208 Cessna Caravan	**Operator:**	Tropic Air
Role:	Passenger Transport		

2. Details

The single-engined Cessna Caravan operated by Tropicair crashed into a river while flying from Kimusi to Purari in Gulf province yesterday afternoon.

The Accident Investigation Commission says 10 people were on board and seven survived..[2]

3. References

(1) http://aviation-safety.net/wikibase/wiki.php?id=162508 ,accessed 26 Nov 2013;

(2) http://www.abc.net.au/news/2013-11-26/three-killed-in-png-plane-crash/5117600 ,accessed 26 Nov 2013;

(3) http://www.thenational.com.pg/?q=node/60216 ,accessed 27 Nov 2013.

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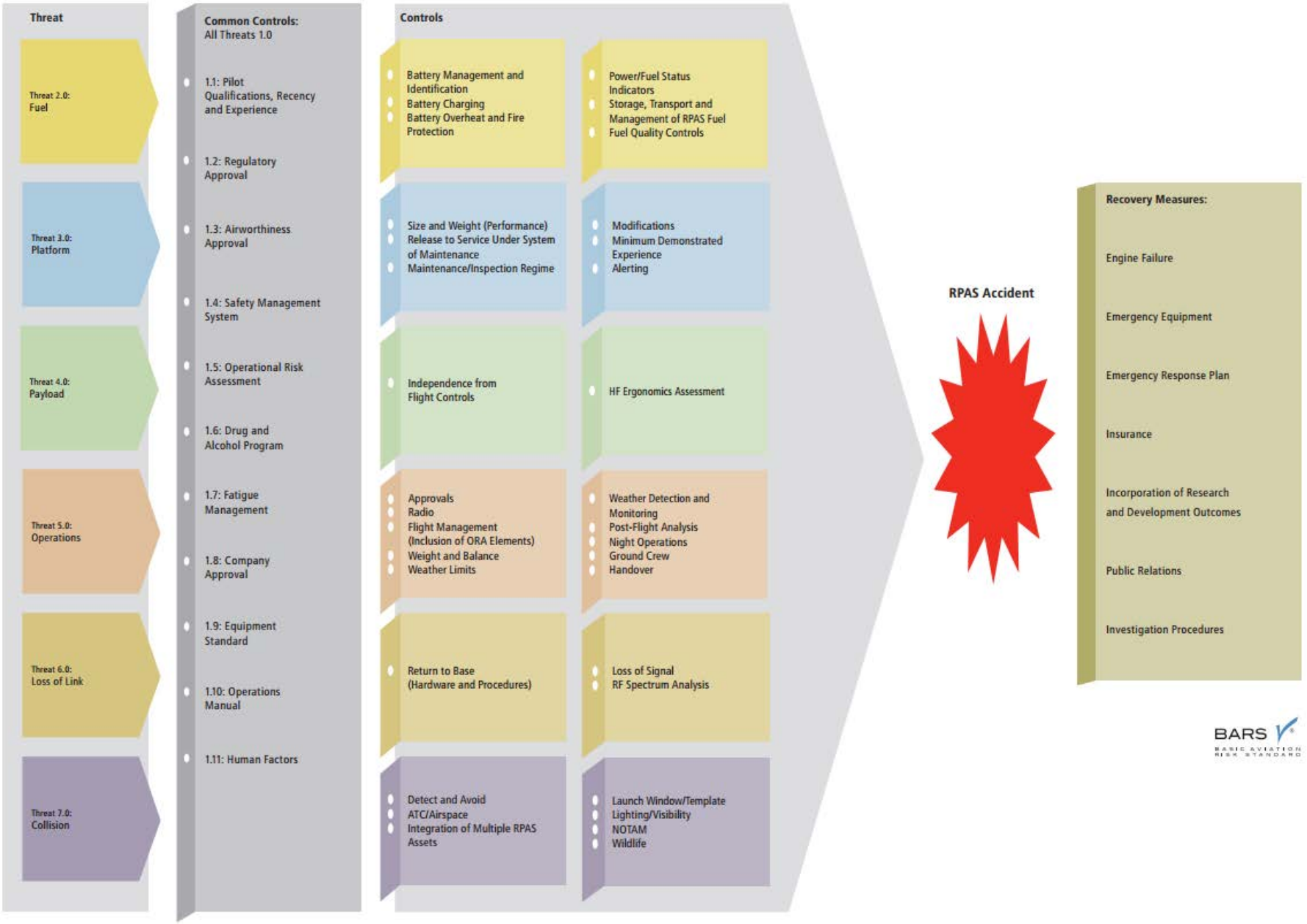
The BARS Suite


Threat
Threat 2.0: Fuel
Threat 3.0: Platform
Threat 4.0: Payload
Threat 5.0: Operations
Threat 6.0: Loss of Link
Threat 7.0: Collision
Common Controls: All Threats 1.0
1.1: Pilot Qualifications, Recency and Experience
1.2: Regulatory Approval
1.3: Airworthiness Approval
1.4: Safety Management System
1.5: Operational Risk Assessment
1.6: Drug and Alcohol Program
1.7: Fatigue Management
1.8: Company Approval
1.9: Equipment Standard
1.10: Operations Manual
1.11: Human Factors
Controls
Battery Management and Identification
Battery Charging
Battery Overheat and Fire Protection
Power/Fuel Status Indicators
Storage, Transport and Management of RPAS Fuel
Fuel Quality Controls
Size and Weight (Performance)
Release to Service Under System of Maintenance
Maintenance/Inspection Regime
Modifications
Minimum Demonstrated Experience
Alerting
Independence from Flight Controls
HF Ergonomics Assessment
Approvals
Radio
Flight Management (Inclusion of ORA Elements)
Weight and Balance
Weather Limits
Weather Detection and Monitoring
Post-Flight Analysis
Night Operations
Ground Crew
Handover
Return to Base (Hardware and Procedures)
Loss of Signal
RF Spectrum Analysis
Detect and Avoid
ATC/Airspace
Integration of Multiple RPAS Assets
Launch Window/Template
Lighting/Visibility
NOTAM
Wildlife
RPAS Accident
Recovery Measures:
Engine Failure
Emergency Equipment
Emergency Response Plan
Insurance
Incorporation of Research and Development Outcomes
Public Relations
Investigation Procedures
BARS
BASIC AVIATION RISK STANDARD

RPAS Bow-Tie

- 150 aircraft operators have been audited since Nov 2010
- 29 different countries represented
- 143 301 audit questions asked to see 10 411 non-conformities raised
- 6 data analysis reports completed on the data from the Program including external loads, geophysical operations, off shore helicopter operations and the repeat finding analysis
- 10 quality reports generated looking at quality control and assurance aspects of the Program
- 100% close out rate on the non-conformities in the last 18 months
- 50 active auditors in the Program
- Across the current 108 operators listed in BARSoft we touch 62 000 employees.
- Of the operators who have been audited in BARSoft there are 1003 fixed wing aircraft and 557 rotary wing aircraft listed for use on a BMO contract
- 17 Technical Advisory Meetings and 13 Audit Company review meetings have been conducted in the system of governance for the Program

BARS Program Data/Stats

BARS®

BASIC AVIATION RISK STANDARD

FLIGHT SAFETY FOUNDATION