CERTCENTERCANADA

2020 3C Certification Services

AIR WORTHY

IASS 2020

3C Overview
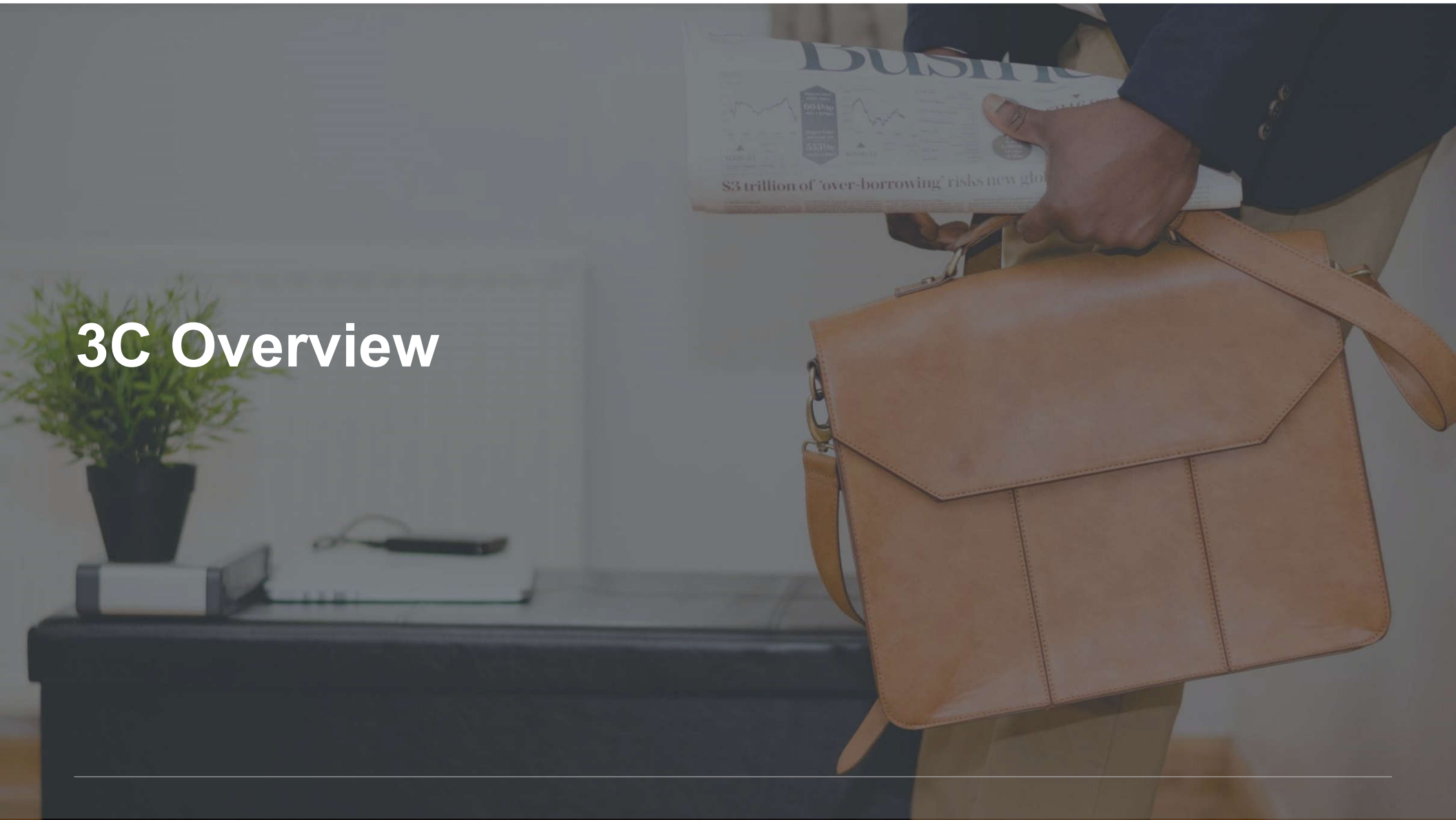
3C Executive Team

Established, experienced and well-respected team

DR. JOHN MARIS
President & Owner

MR. PHIL COLE
Vice President Business
Development

MR. SAM GRAINGER
Vice President Operations

Awards

Canadian American Business Achievement Award
Awarded for leading a joint enterprise demonstrating strong business growth, remarkable innovation, noteworthy contributions to local communities and the capacity to provide their partners with a global advantage

Canadian Aeronautics & Space Institute: Trans Canada (McKee) Trophy
Canada's oldest and most prestigious aeronautical trophy awarded to Marinvent for the Canadian whose achievements were most outstanding in promoting aviation in Canada

Aviation Week & Space Technology Laureate
Awarded for "..helping to transition from paper in the cockpit to a digital flight deck."

Canadian Business Aviation Association Industry Award
Outstanding contribution to aviation

Aerospace Association of Quebec (AQA) Prix de l'Entreprise
Aerospace company of the year

Canadian Business Aviation Association Industry Award
Awarded for the safety gains achieved through human factors enhancements, systems engineering and flight test services.

Create the Future Award
APM product winner

New Zealand Ministry of Defense Award of Excellence to Industry
Marinvent singled out as one of the two most valuable contractors from a pool of more than 800 contractors for contributions to C-130 LEP and P-3K capital programs

AIAC James C Floyd Award
Aerospace company of the year

C2-MTL Annual Aerospace Award
Marinvent's work on unmanned aerial systems flight test and evaluation with its Piaggio Avanti project singled out as aerospace innovation of the year

NASA
Small Business Subcontractor of the Year (TASAR)

NASA
LaRC 2014 Group Achievement Award

Canadian Defense Executive of the Year
Dr. John Maris

Canadian Aviation Hall of Fame
Dr. Maris Inducted

Canadian Defense Review
Canadian Top 50 Defense Companies 2015 - 2020

Description of 3C Business

Spun out of Marinvent in 2016

One of the highest profile and most award-winning aerospace SMEs in Canada.

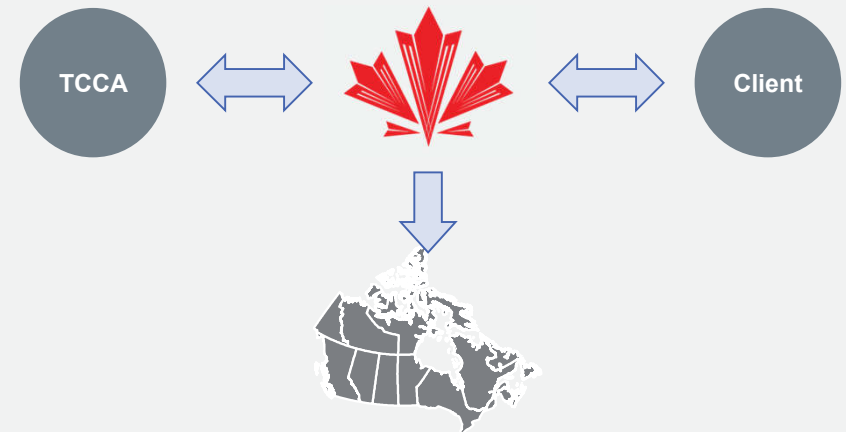**Only Independent Flight Test and Certification DAO**

TCCA-approved for **Full-Service** flight test and certification in Canada in March 2017 and is already generating revenue.
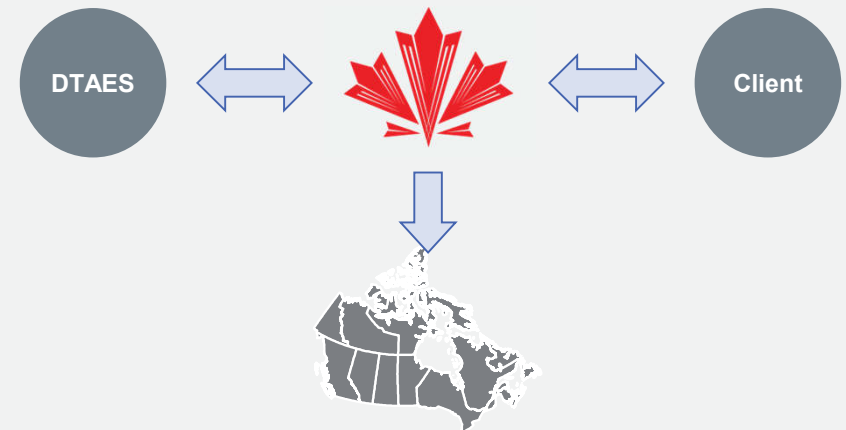
Industry 4.0 compliant tools

Web-based software tools for planning, optimization, and management. Integrates with PLM tools to save 20% of costs.

Civil Client Model

TCCA ⇄ 🍁 ⇄ Client

Defence Client Model

DTAES ⇄ 🍁 ⇄ Client

The Perfect Storm - increased demand and reduced capacity

1,500+ New certification projects per year

Certification capacity inefficiently distributed across the country and NON TRANSFERABLE – contracting problematic
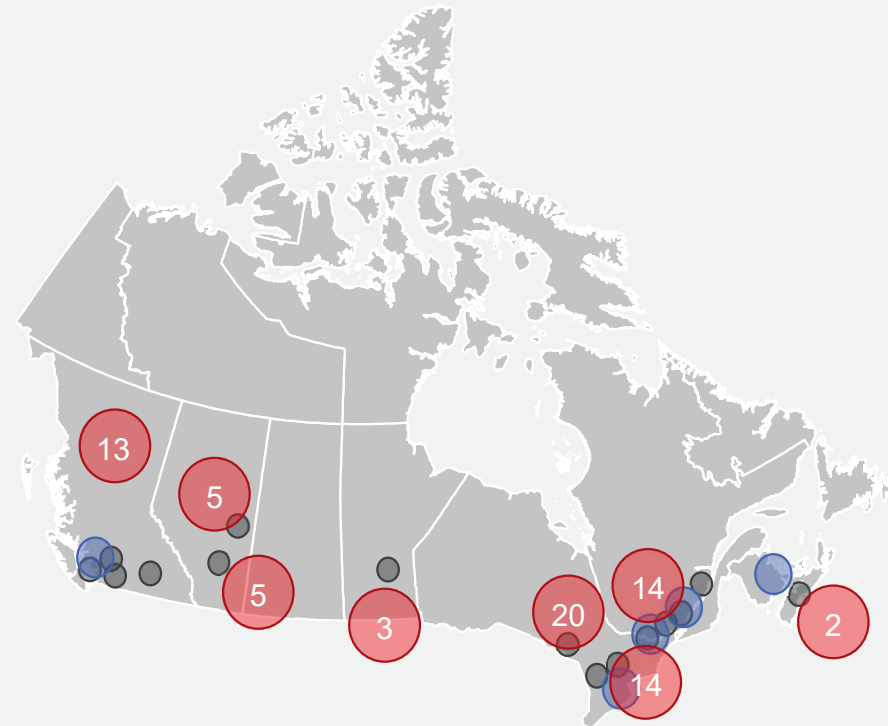
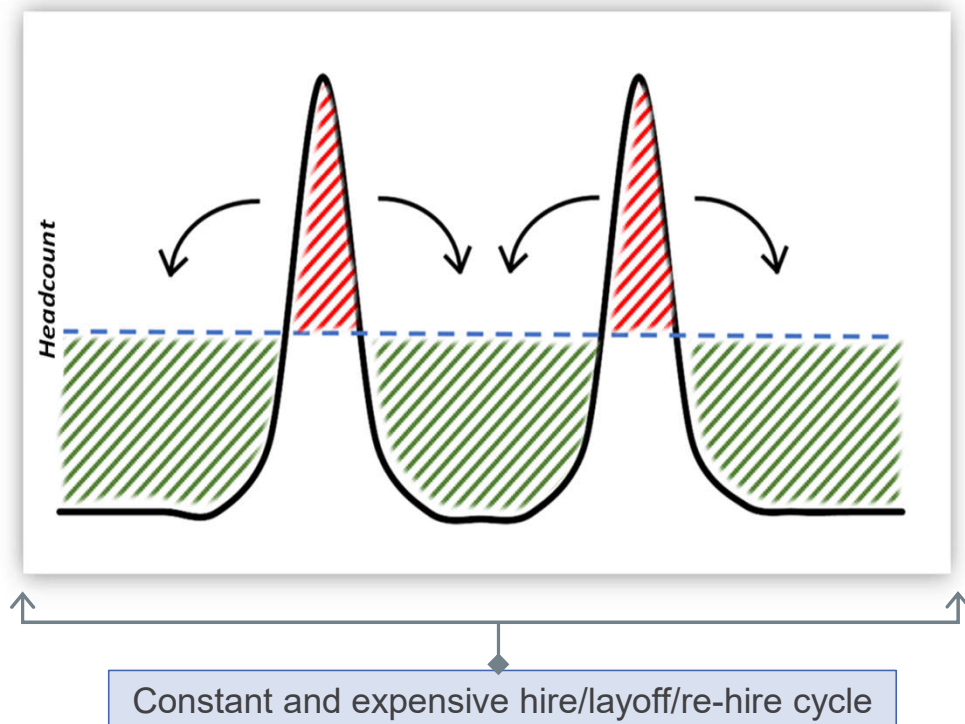**50%** Loss of TCCA staff

The industry **needed** a change

Certification Map of Canada

- 13
- 5
- 5
- 3
- 20
- 14
- 14
- 2

🔴 76 DARs across Canada

🔵 5 TCCA Regions across Canada

⚫ 43 DAOs across Canada

A New Certification Model for the Future

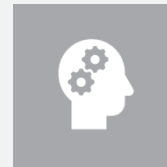Periodic Certification Staff Demand for Projects

Constant and expensive hire/layoff/re-hire cycle

Previous system was inflexible, making it impossible to maintain resource levels

Certification is difficult, requiring many years of training

Recruits must be mentored, not taught, which drains more resources and time

The TCCA and DTAES crisis is affecting everyone

3C offers the only viable solution to these problems

3C Services

Unique

Flight Test Planning and Execution
Independent outsourced expert services in accordance with appropriate standards for either civil or military customers, or on behalf of DND

Outsourced Services Provision
To Transport Canada, DTAES and ADM(Mat) to assist them in managing demand peaks, staff shortages and training needs

Outsourced Airworthiness & Certification
To civil and military customers, including Applicant's Representative services

Training Next Generation of Delegates
Training / Mentoring the next generation of certification professionals is critical to the future of Canada's aerospace and defence sectors

Program Management Services
Fully independent and outsourced using Synthesis® tools and delivered by PMPs

Complete Expert Process Training
All aspects, including: Flight test engineering, airworthiness and certifiable product design

Rare

Business Planning & Product Design
Consulting for companies specifying or designing new aerospace and defence products that must meet airworthiness requirements

Tier 0 Consulting Services
For Government Customers to help them make the best aviation-related procurement decisions

Market Primed for Change

Key factors

- Companies want faster/cheaper ways to obtain airworthiness approval and certification

- Shrinking capacity in the existing infrastructure
  - Bandwidth inadequacy and expertise turnover

- Ramp-up of defence spending on programs requiring airworthiness approval

- Inability to enact new regulations for previously-uncertified platforms and systems:
  - Artificial Intelligence, 3D Printing, Virtual Testing, Industry 4.0, Urban Air Mobility, Hybrid and Fully Electric Propulsion

Current 3C Delegates

- Michel Brulotte AP008, Helicopter QTP[1], FTA[2]
- Shawn Coyle AP002, Helicopter FTA
- Stephen Day AP006, QTP
- Chuck Ellis CSeries Chief Test Pilot AP010, QTP
- Sam Grainger AP003 S/W & Airborne H/W
- Waldemar Krolak AP011,FTE, TSO[4]
- Jim Manton AP012, QTP
- John Maris AP001, QTP, FTA, TSO
- Jim Martin AP007, FTE, FTA
- Danielle Méthot AP004, S/W
- Hany Sadek AP013, FTA
- Avionics Design Services, Systems-Avionics DAO
- M1 Composites, Structures DAO
- Bob Gow AP_, Systems, Avionics
- Mike Taews AP_, Structures
- Nadine Beaugé, AP_, S/W & Airborne H/W

To be added to next DAPM
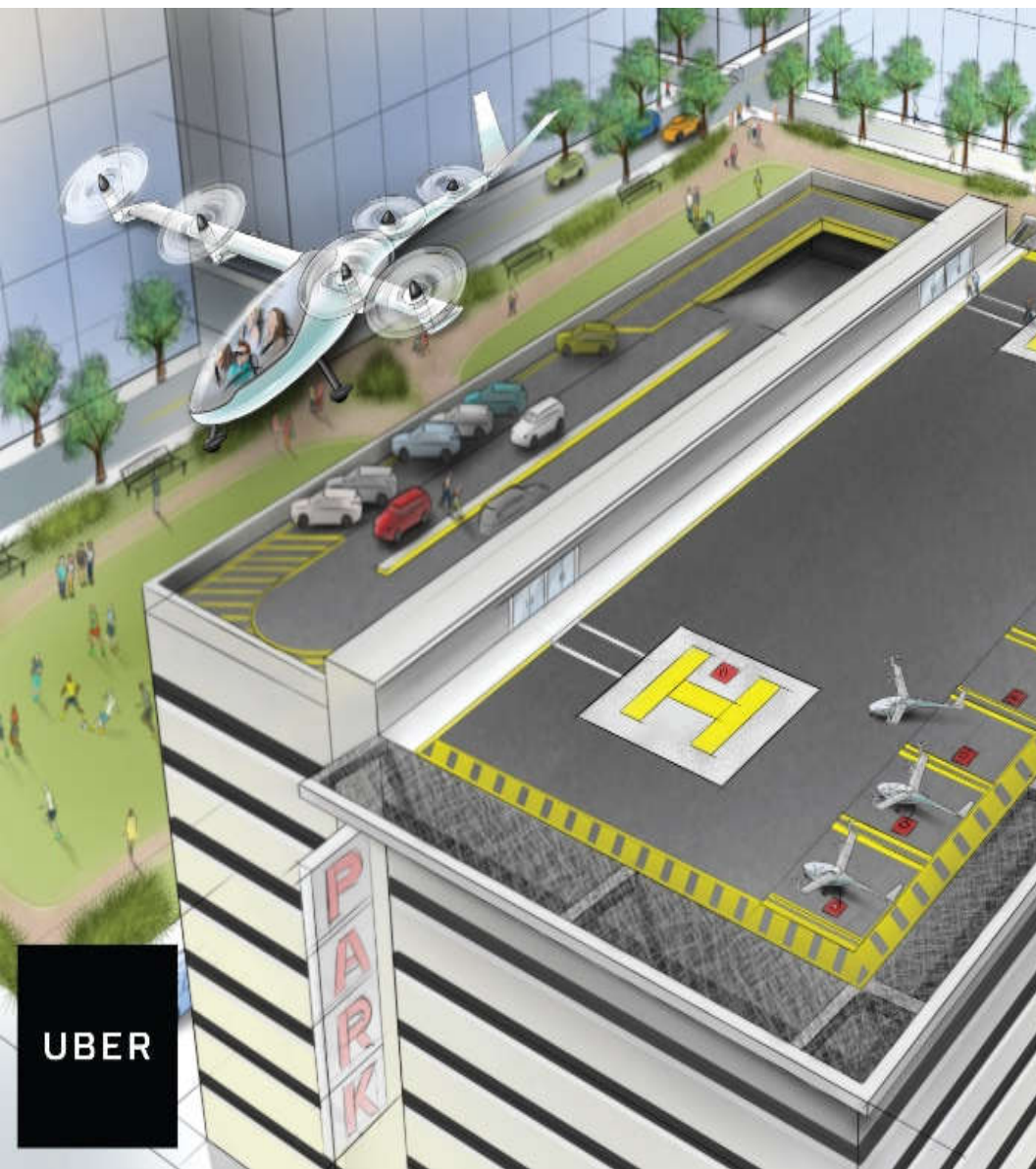
Aerospace is Changing

- New Technologies
- New Infrastructure
- New Operational Models
- New Target Pricing Paradigm
- More & More Software
- New Regulations
- Maintain Safety & Security

UBER

More Software-Centric Systems

- Airspace Management
  - ABTM or ATC or independent UTM
  - Operations Centres and Command and Control
- Systems for Autonomy
  - Semi-Autonomous
  - Detect and Avoid
  - Navigation
  - Route planning
  - Route Optimization
- Energy Optimization
- Security
- Completely new booking systems
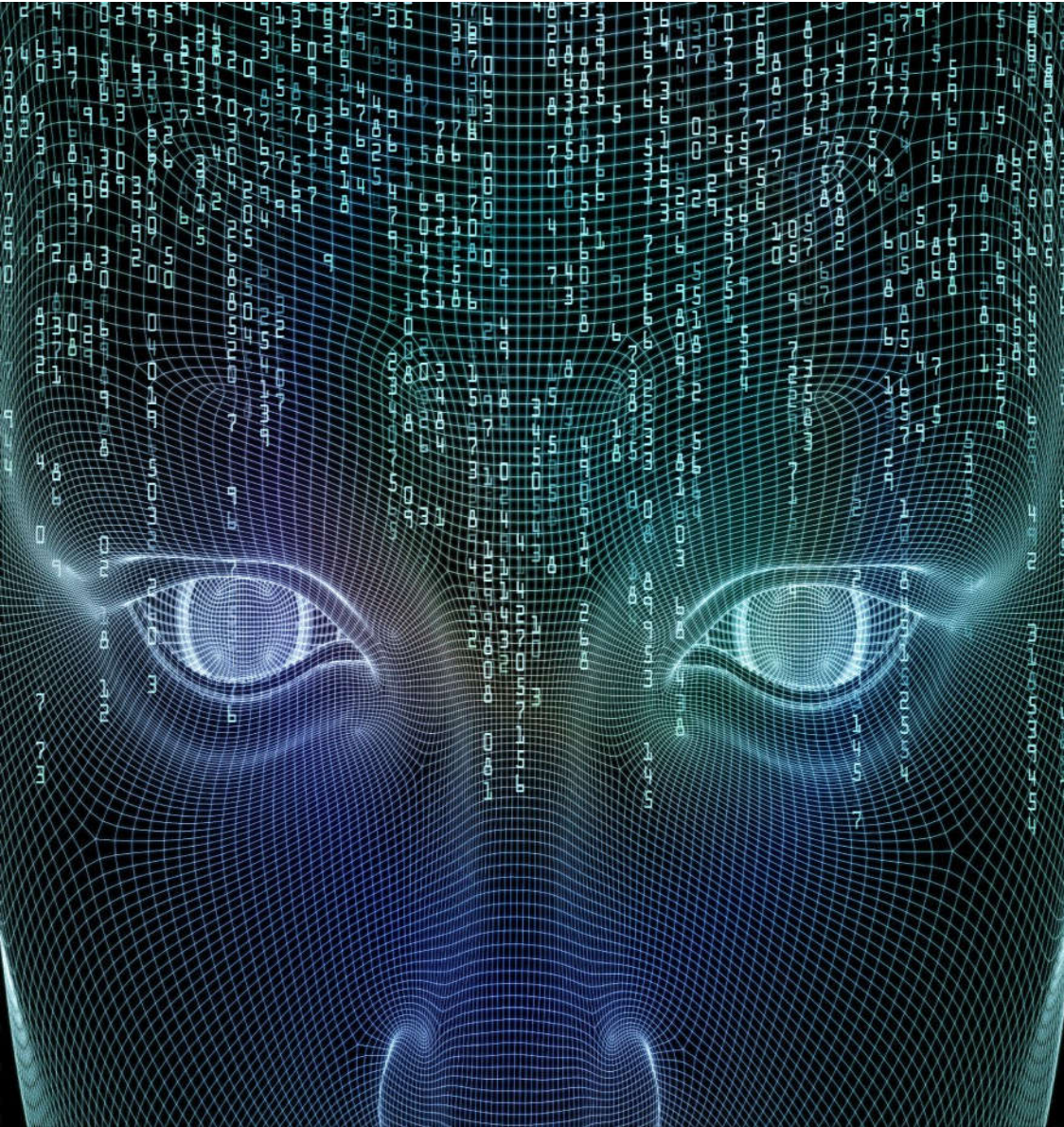
Safe Software and AI

- Means DO-178 or some derivative
- Seriously constrains where software goes and what it can do
- Costs a great deal compared with typical software (x10 at least)
- Determinism / Predictability
- Statically compiled
- Development process
- Restricted access to many processing resources
- Restricted access to tools

Another Way to View This

- Constrain the software behavior
- Supervision to protect what is outside from anomalous behavior
  - Well defined ICD
  - Health monitored
  - Error checked
  - Boundary checked
  - Firewalled
  - …
- Multiple dissimilar code blocks for redundancy with voting
- A Fully Certifiable code "safe"
- Also useful from security perspective
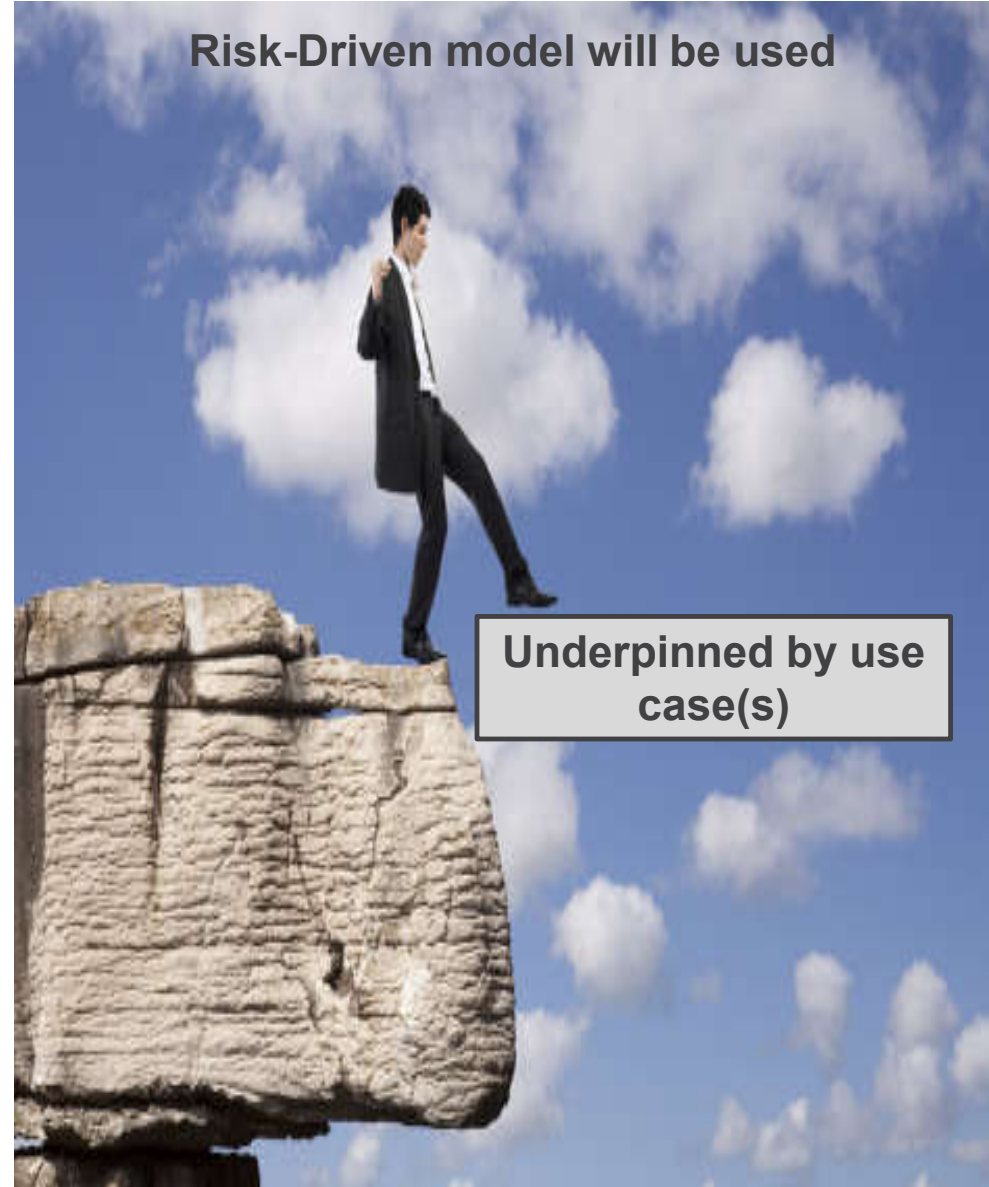
Practicalities

Regulations = Laws

Public Acceptance is a serious obstacle

Regulations and Technologies must evolve together

Risk-Driven model will be used

Underpinned by use case(s)

Integrated Model Required

Why 3C

- Benefits of being Canadian
  - Leverage of Canadian tax credits
  - Advantageous exchange rate
- Flexibility
  - Rapid scalability and partner leverage
  - No "nickel and diming"
- Reputation with Regulators and customers
  - Ethically-driven, unparalleled integrity, close-knit team of recognized industry professionals
  - 3C is part of the design & certification team (not "job shop")
  - Technical project managers (PMPs) for all projects
- Very broad experience with the "new"
  - Understand the technologies themselves and how to certify them
- 3C's tools minimize Cost, Risk, Schedule
  - Purpose-built to optimize cert & flight test (>20% saving)

CERTCENTERCANADA

Canadian Controlled Goods
AS9100
Security Clearances in place

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Vice President Business
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