Regulators & Resilience: How Cybersecurity and Aviation Standards Are Converging

Mike Robb, Vice President, Engineering | December 2025

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Introduction

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Mike Robb

Vice President, Engineering
Woodward, Inc.

- Lead Woodward's Aerospace Electronics team to develop cleaner, more-electric, safety-critical control systems for next-generation aircraft
- Hold a multitude of software certifications across all relevant domains
- Live in a forest where I buck, chop and stack firewood
- Published author of 200+ children's and young adult sci-fi books

Woodward, Inc. designs and delivers world class controls for aerospace applications

Integrated Propulsion Systems

- Fuel Systems
- Engine Actuation
- Thrust Reverser Actuation
- Fuel Injection & Ignition
- Oil & Air Management

Flight Deck Controls

- Side Sticks
- Throttles
- Pedals
- Flap Levers

Aircraft Actuation & Controls

- Electromechanical Actuation
- Hydraulic Actuation
- Precision Motors
- Servo Controls
- Sensors

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OUR PURPOSE

To design and deliver energy control solutions our partners count on to power a clean future.

OUR CORE VALUES

Integrity
We do the right thing. Always.

Respectful & Accountable
We hold each other in high esteem and hold each other to high standards.

Humble & Driven
We're confident but not arrogant.

We're always striving for better.

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My journey here…

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Setting the Stage: Regulatory Evolution

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Cybersecurity Challenges in Aviation

Emerging Threats

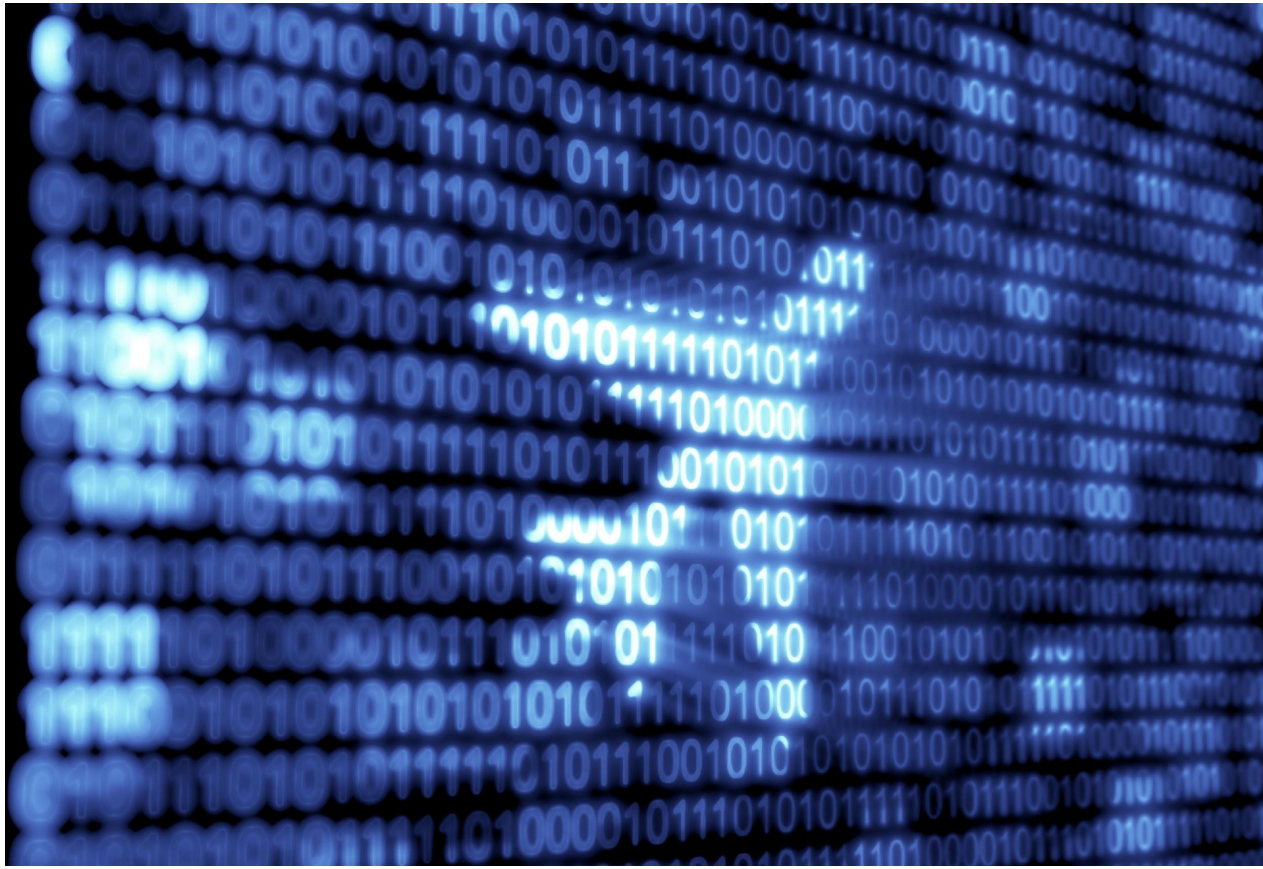
- Increased use of wireless communication, IoT, and networked avionics systems
- Risk of cyberattacks targeting critical systems like flight controls and navigation

Regulatory Landscape

- RTCA DO-326A/ED-202A: Airworthiness Security Process Specification.
- DO-356A/ED-203A: Security Assurance for Airborne Systems.
- EASA and FAA cybersecurity initiatives

Key Vulnerabilities

Legacy systems and third-party software heighten supply chain risks



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Airworthiness Meets Cyber Resilience

- Aviation regulators increasingly embedding **cybersecurity** within **airworthiness** frameworks
- Cyber threats now viewed as **safety threats**, prompting a unified regulatory approach
- Merging airworthiness and digital resilience is reshaping compliance, certification, and operational readiness

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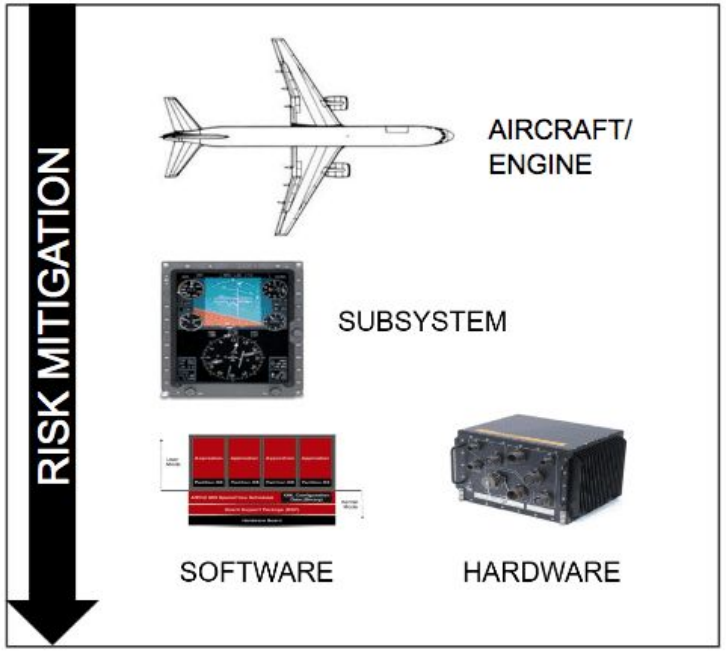
Commercial Cyber History
EASA, FAA integrating cyber policies for engine and prop controllers

AVIONICS SAFETY & EVOLVING SECURITY GUIDELINES

Part 25 Example



Airworthiness Laws
- CFR 25.1309 (US) / CS 25.1309 (EU)

High-Level Guidelines
- ARP 4761 & ARP 4754A
- FAA AC 20-115D, EASA AMC 20-115D
- **Proposed AMC 20-42 (NPA 2019-1)**

Guidelines for Safety
- RTCA DO-297, EUROCAE ED-124
- RTCA DO-178C, EUROCAE ED-12C
- RTCA DO-254, EUROCAE ED-80

Guidelines for Security
- **RTCA DO326A, EUROCAE ED-202A**
- **RTCA DO-356A, EUROCAE ED-203A**
- **RTCA DO-355A, EUROCAE ED-204A**

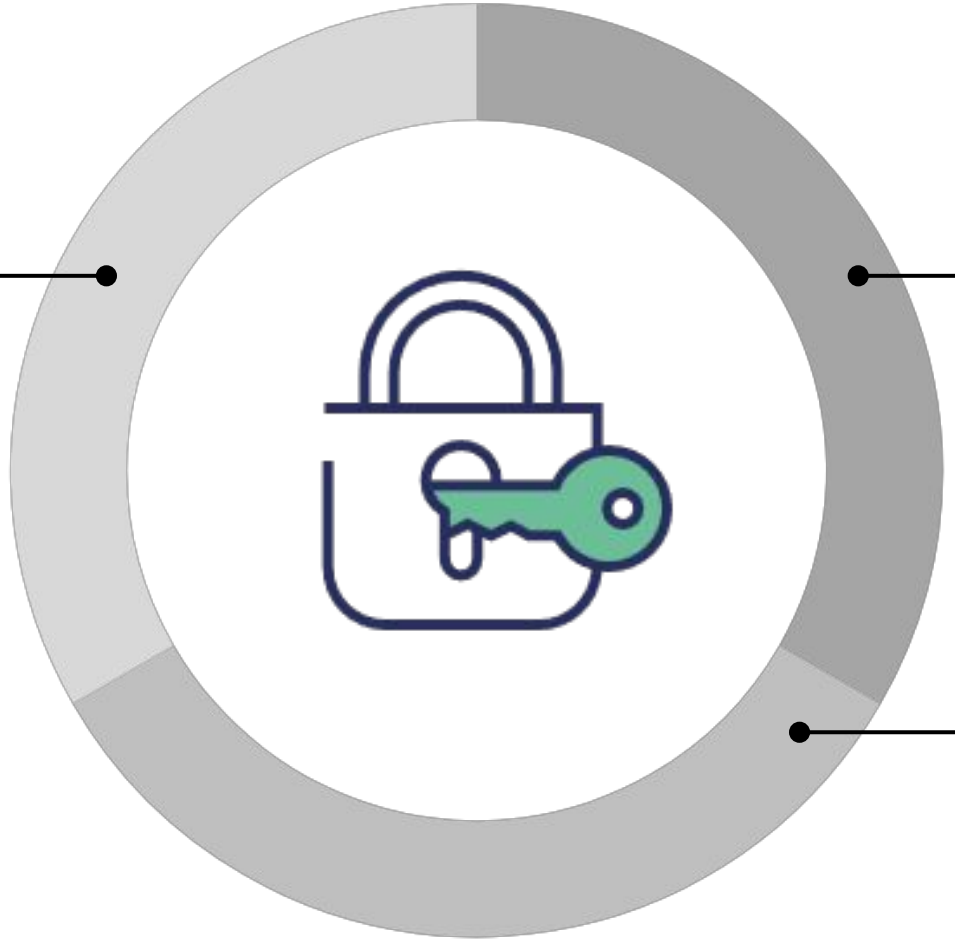
Aircraft Cybersecurity
- Security Risk Assessments: SAL Levels
- Network/Interface Security
- Engine & Prop Control Systems Specifically Cited

RTCA Guidance
- Drafts in work currently
- “Special Consideration” required for deviations

Cyber Security Component Analysis

Application Security

Protection of embedded software ensuring integrity not compromised



Physical Security

Protection from a person directly access computer data, files, components

Protection from access through Internet/Intranet

Network Security

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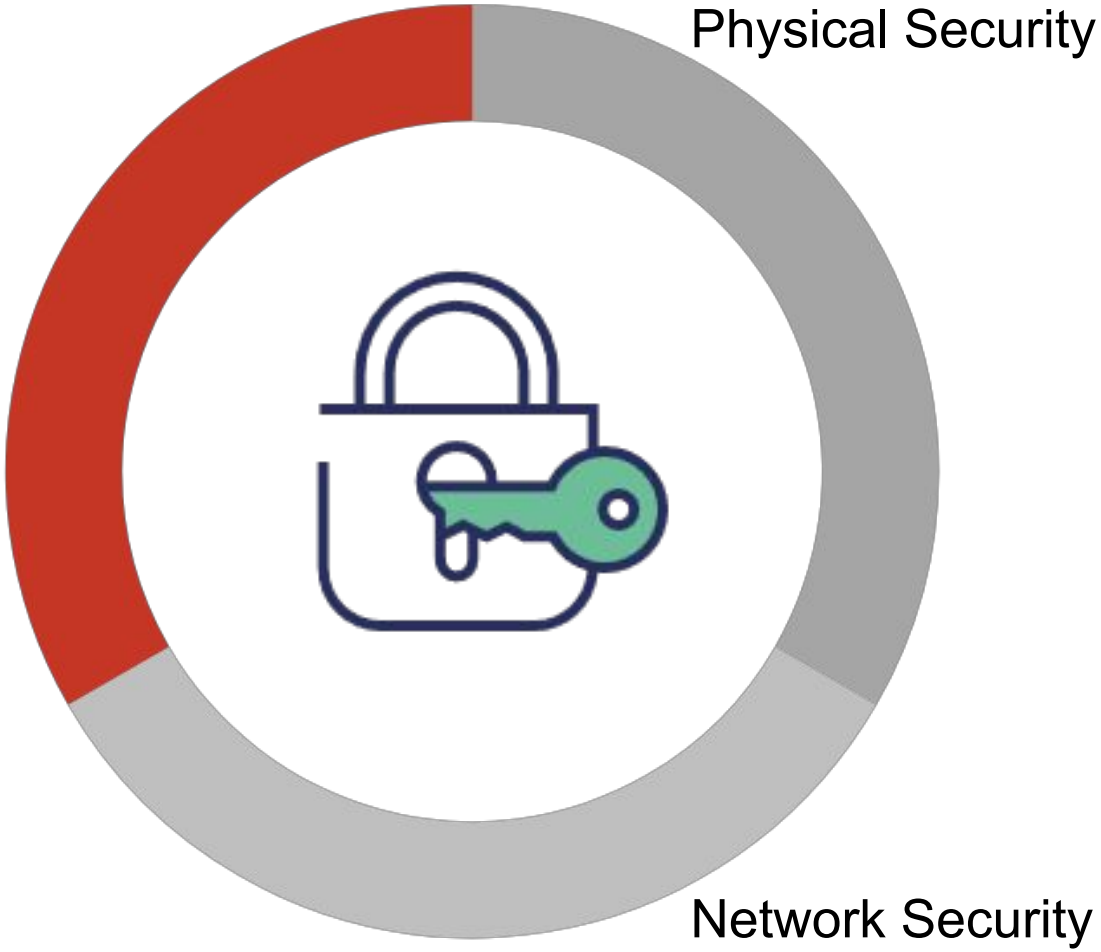
Spotlight on Application Security

- **Integrity**: Code Validating
- **IP-Protection**: Encrypting Decrypting
- **Key-Management**: Handling & Distributing
- **Interface**: Protecting & Validating
- **Hardware**: Fusing Keys into processor
- **Process**: Developing Methods



Understanding the DO-178
(Software Considerations in Airborne Systems and Equipment Certification)

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DO-178 A → B → C: Evolution of Airborne Software Certification

- Primary software safety standard for airborne systems
- Successive RTCA guidance that scales software rigor by safety level
- **DO-178C is today's baseline**
- Adopted by major regulators (FAA, Transport Canada, EASA)
- Military and defense sectors often require additional or modified standards such as mission-specific cybersecurity layers

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DO-178C and ED-202A are Complementary Standards

Software Safety

DO-178
Software Considerations in Airborne Systems and Equipment Certification

- Design Assurance Levels
- Requirement Based Development
- Verification and Validation
- Configuration Management
- Quality Assurance

System-level Cybersecurity

ED-202A
Airworthiness Security Process Specification

- Security Risk Assessment
- Security Requirements
- Secure Architecture and Design
- Verification and Validation Measures
- Lifecycle Security Management

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The Convergence of Cybersecurity and Airworthiness

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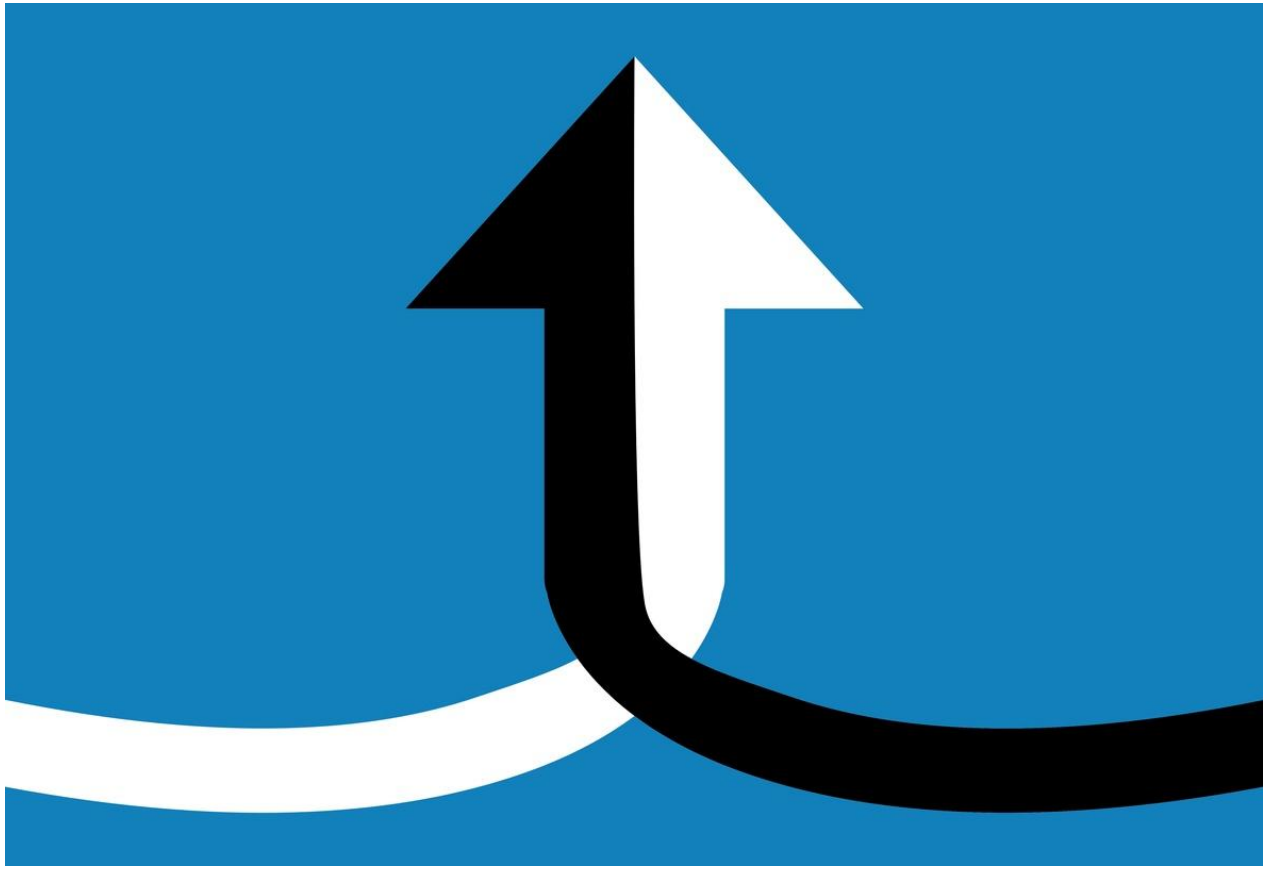
Converging Requirements, One Compliance Path

- Traditional vs. emerging requirements
  - From functional safety to cyber resilience
- Companies are unifying compliance frameworks
- Real-world implications of noncompliance
  - costly delays
  - certification rework
  - potential safety impacts



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Woodward's Approach: Built-in Compliance and Continuous Readiness

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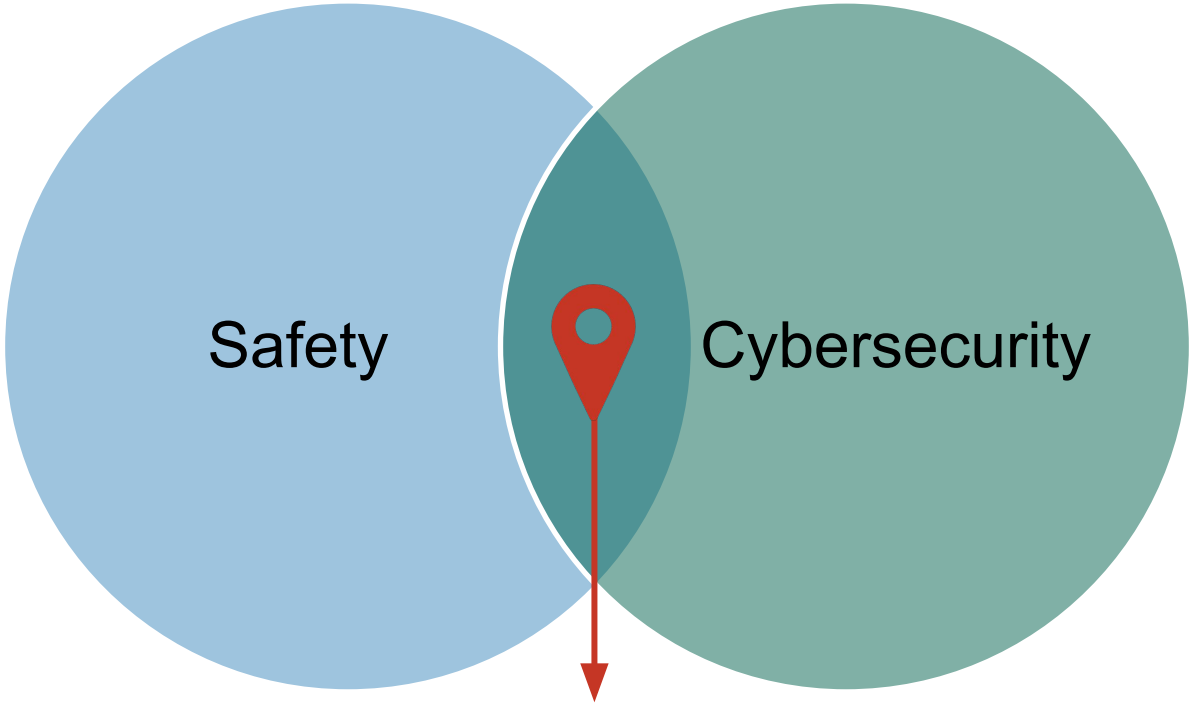
Engineering Compliance Designed into Our Code

Woodward takes a proactive approach

- Designing compliance and security directly into product software architecture
- Establishing proactive cybersecurity processes to ensure DO-178C alignment
- Monitoring regulatory changes with a dedicated team tracking FAA, EASA, and Transport Canada requirements
- Leveraging DO-178 expertise to support programs and customer partnerships
- Driving a continuous improvement mindset across all initiatives

DO-178C and Cyber Security Alignment

- Focus on functional safety
- Ensures deterministic behavior of software
- Software verification and validation
- Compliance with aviation safety regulations



SHARED GOALS
System Integrity
Reliability
Verification & Validation
Defense-in-Depth

- Protects against malicious attacks (e.g., hacking)
- Data confidentiality, integrity, and availability
- Threat modeling and risk assessment
- Secure Boot and communication protocols

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Compliance and Audit Readiness

Framework Alignment for Security Assurance

- **Update** - WWD Engineering Processes to integrate Security Development Life Cycle (SDLC)
- **New** - WWD Standards for SDLC Methods/Activities
  - Reference in Program Planning
- **New** - WWD SDLC Review Checklists
  - Peer Review Checklists for verification of outputs of SDLC, based on SDLC standards
- **New** - WWD Templates for artifacts from SDLC
- **Maintain** - Configuration Management Rigor consistent with DO-178C

Looking Ahead:
Building a Resilient Future

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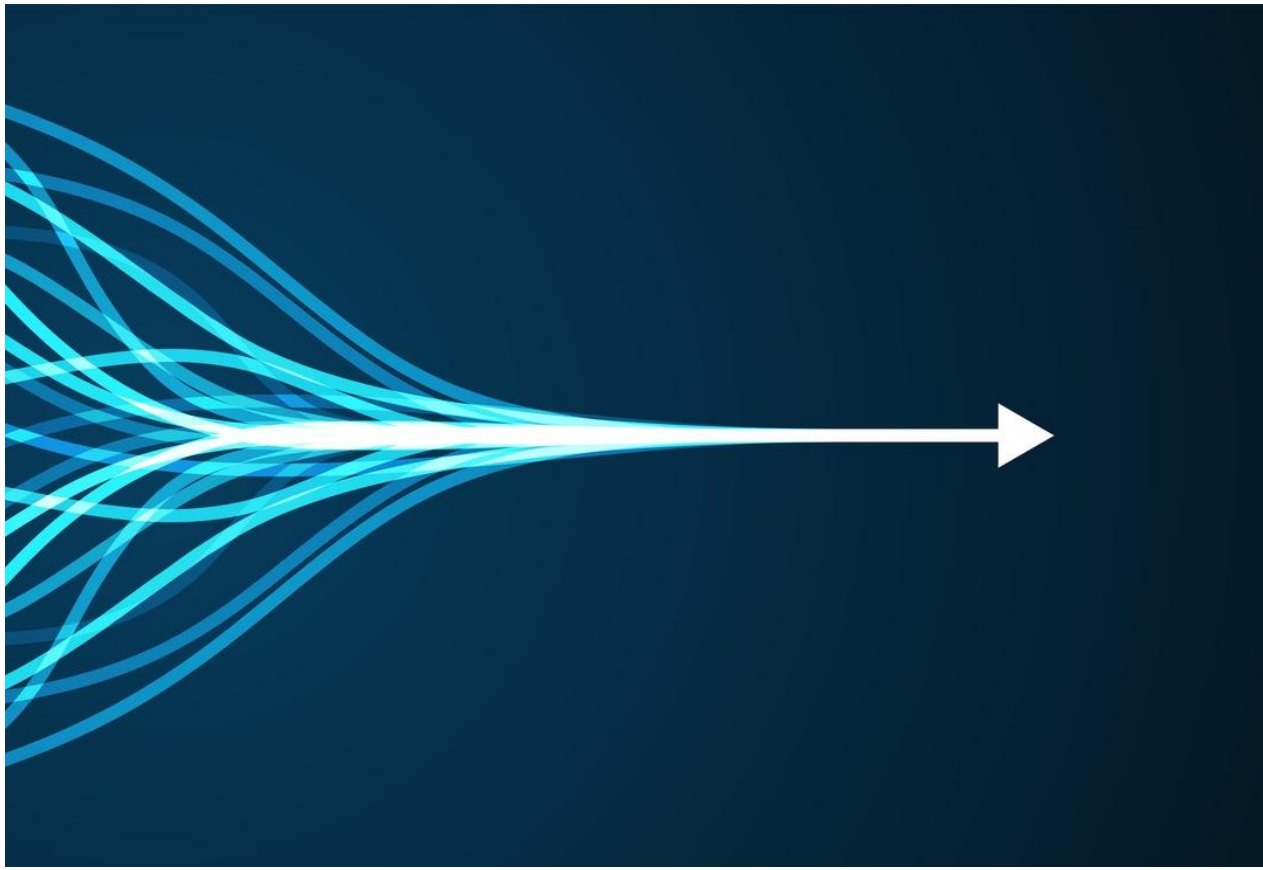
Road Forward & Woodward's Commitment

- Predict the continued convergence of safety and cybersecurity regulation toward a **living global standard**
- **Collaboration** between regulators, industry and suppliers is key
- Woodward will continue to **lead by example** to enable safer skies



My journey home…


Q & A

Powering a clean future

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