



Federal Aviation  
Administration

# New Technology: A challenge for regulators?

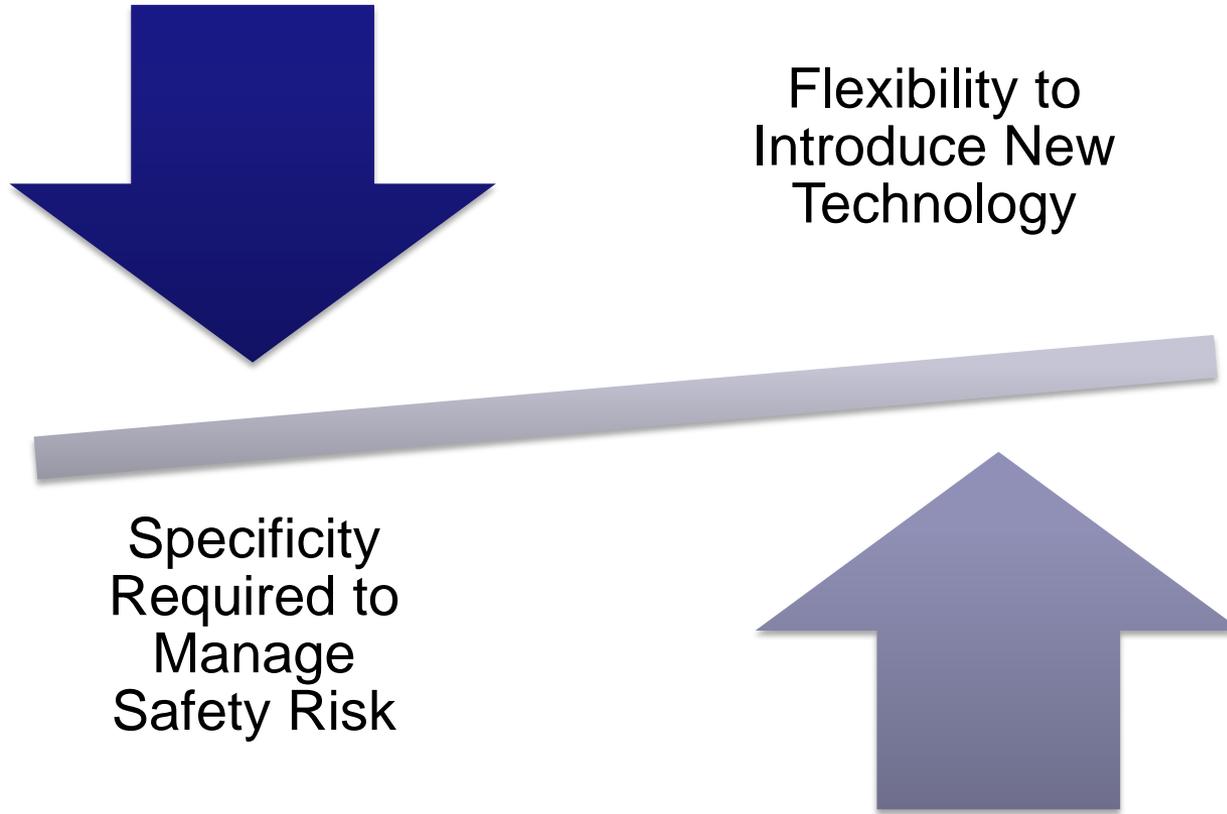
Safety is a source for  
technological innovation

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# Innovation Requires a Balanced Approach



- Traditional rulemaking is not rapidly adaptable but is itself the result of a thorough, collaborative, and investigative process.

# Managing Safety when Introducing New Technology

## Regulation

- **Intended Use**
- **Risk Mitigation**
- **System Effects**
- **Standards**

## New Technology

- **Past Practice**
- **Lessons Learned**
- **Tech Maturity**
- **Benefit**

# Defining Specifics Required to Manage Safety

## 1. Evaluate technology as a system

- ✓ How is the technology proposed to be used?
- ✓ Understand why it is being introduced and review existing standards.
- ✓ Review lessons learned from similar technologies/systems

## 2. Determine the potential safety system impact

- ✓ Work with the applicant, FAA experts (e.g., CSTA), and industry groups to better understand challenges, benefits, and vulnerabilities of technology as it is proposed for use in aircraft environment
- ✓ Identify existing research activities / propose new

## 3. Develop requirements and/or best practices

- ✓ Identify existing best practices
- ✓ Establish test and analysis commensurate for the system to fully assess impact at the airplane level
- ✓ Incorporate lessons learned

# Flexibility in Existing Certification Processes

- **New Technology – Existing Regulations**

- Applicant may propose a unique means to comply with in scope of existing regulations for new technology
- Industry standards serve as an outstanding option to regulators and industry

- **Supporting Industry Standards**

- Regulators begin coordination on new/emerging technologies with Industry Standards organizations (e.g., ASTM, SAE, RTCA)
- These groups are supported by technical experts from industry and academia
- These standards can serve as methods of compliance to existing regulations or special conditions



# Flexibility in Existing Certification Processes

- **Special Conditions (§ 21.16)**
  - Applicant design features may require when existing rules do not address new or novel technology
- **Equivalent Safety Findings (§ 21.21(b)(1))**
  - Used when the design is equivalently safe yet does not comply
- **Exemptions (14 CFR 11)**
  - Used when there is no adverse affect on safety and it is in the public interest

# Examples of Incorporating New Technology

- **New Means of Compliance**
  - Wireless Technology, Auto-Throttle, Vertical Required Navigation Performance
- **Special Conditions**
  - Electronic Flight Controls, Torque Loads Due to High By-Pass Engines, Crashworthiness of Composite Fuselage
- **Equivalent Safety Findings**
  - LED Position Lights, Computation Fluid Dynamic Models in Lieu of Flight Test
- **Exemptions**
  - Side facing Seats, High Altitude Ops, Dutch Roll



# Summary

- We have flexibility to introduce technology, safely.
- We consider design *and* operation to manage risk.
- We have access to the right resources so together we may develop standards based on collective knowledge

