US Commercial Space Transportation Regulatory Approach

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Regulatory Challenge

- Commercial Space Transportation is experiencing rapid growth and new vehicle development.

- Diversity of vehicle types, launch configurations, and spaceport layouts pose a regulatory challenge.

- Regulations must reflect the velocity of industry development and its wide technical diversity.
FAA-Licensed Launches, 2010 - 2014

- FAA licensed suborbital launches
- Launches conducted under FAA Experimental Permits
- FAA licensed launches of non-geosynchronous (NGSO) payloads
- FAA licensed launches of geosynchronous (GSO) payloads

Includes 13 licensed launches of payloads for DoD, NASA, and NOAA

Source: FAA March 2015
Industry Operational Changes

**PAST**
- Government Rocket
- Government Launch Complex
- Government Range Services
- Expendable Vehicle
- Vertical Launch

**NOW/FUTURE**
- Commercial
- Contract
- Recreational
- Government
- Leased
- Private
- Government
- Contracted
- Private
- Expendable
- Returnable Stage
- Reusable
- Vertical
- Horizontal
- Hybrid/Carrier
- Balloon
Expanding Range of Regulated Operations
ELVs, Suborbital RLVs, Orbital Human Vehicles, Habitats

Virgin Galactic
Sierra Nevada Corp
Boeing
XCOR Aerospace
Masten Space System
Blue Origin
Orbital Sciences
Space X
Bigelow Aerospace
APPROACH TO SAFETY

- Regulate operator to ensure public safety – People and property not involved in flight

- Require space flight participants to acknowledge informed consent in accepting flight risk

- Encourage operators to accept recommended practices for human space flight
FAA LICENSING/PERMITTING PROCESS

PRE-APPLICATION CONSULTATION

• Explain Regulatory Requirements
• Understand Applicants Concept of Operations

APPLICATION EVALUATION

• Flight Safety Evaluation
• Systems Safety Evaluation
• Safety Management System

POST-APPROVAL OVERSIGHT

• Inspection of Compliance with License/Permit
• Inspection of Compliance with Applicant’s Procedures
FAA Regulatory Products

• Launch License
• Re-Entry License
• Launch Permit
• Operator’s License
• Operator’s Permit
• Launch Site License
• Safety Approval

Safety Inspections

• Flight Operations
• Re-Entry
• Rehearsals
• Facility Inspections
• Site Inspections
• Safety Procedures
• Commander’s Advisory Board
Interfaces with Aviation Regulation

- Air Traffic Control
- Airports
- Aircraft Certification
- Flight Standards
- Manufacturing Inspection District Office
- Flight Standards District Office
- Rulemaking
- Civil Aviation

- Integrating Into Controlled Air Space
- Integrating co-Located Space Ports
- Hybrid/Carrier Aircraft Certification
- Pilot Certification
- Local Oversight of Aircraft Manufacturing
- Oversight of Certified Aircraft
- Coordination with Aviation Regulations
- Possible Data on Space Flight Participants
FAA/AST Regulatory Progression

- Public Safety
- Occupant Safety
- Public Safety
- Mission Assurance
- Occupant Safety
- Public Safety

Certificates
- Production
- Airworthiness
- Air Carrier
- Pilot
- Instruction
- Mechanic
- Dispatch
- Parts

Current FAA Licensing
- Licensing Human Spaceflight
- Routine Commercial Space Travel
- FAA Certification

Time