NASA Aircraft Program

• Missions
  – Space Operations
  – Science Research
  – Aeronautics Research

• Capabilities
  – Operational
    • Worldwide
    • Flight Test/Research
    • Remote Sensing
    • In situ Sampling
  – Maintenance
    • O-I-D-OEM
    • Fabrication
  – Engineering
    • Airworthiness
    • Wind Tunnels
    • Simulations
    • Test Articles
NASA Aircraft

64 active aircraft  ~11,700 flight hours annually  ~7,200 sorties
NASA Authority

• The National Aeronautics and Space Act
  – “...plan, direct, and conduct aeronautical and space activities;”

• Public Law 106-181, codified in Title 49 U.S.C., Chapter 401, Sections 40102(a)(37) and 40125
  – Definition of Public Use Aircraft

• OMB Circular A-126
  – Improving the Management and Use of Government Aircraft

• 41 CFR 102-33
  – Management Of Government Aircraft

• FAA Circular 00-1.1 “Government Aircraft Operations”

• NASA Procedural Requirements 7900.3C
NASA Aircraft Operations Oversight

• NASA Headquarters Aircraft Management Division
  – Agency Functional Oversight

• Center Flight Operations
  – Program Independent
  – Day-to-day operations

• Inter-Center Aircraft Operations Panel

• Inter-Center Aircraft Operations Review Program
  – Agency conducted inspection program

• Readiness Reviews
  – Airworthiness
  – Flight/Operational
  – Mission

• Safety Management System
  – External Audit

• Aerospace Safety Advisory Panel

• NASA Office of Inspector General
NASA Operational Control

• General aircraft operations are operated in accordance with applicable provisions of the FAA FARs except:
  – Where this directive prescribes more stringent requirements.
  – Where deviations from the FAA FAR have been approved by the FAA, a Center airworthiness/flight readiness review board, or NASA policy

• Specific aircraft operations and maintenance based on the original aircraft certification
  – NASA Aircraft
    • Military or Commercial Derivative
    • Pilots/Aircrew (Civil Servants/Military/Contractor)
    • Mechanics (Civil Servants/Contractor)
  – Contractor Aircraft
    • Commercial Derivative
    • Pilots/Aircrew (Civil Servants/Contractor)
    • Mechanics (Contractor)

• Infrastructure
  – Airports/Ranges
  – Special Use Airspace
  – Instrumented Ranges

• Aircraft Airworthiness
  – NASA Airworthiness Boards
    • FAA Certificate Baseline
    • Military Clearance Baseline
    • NASA Deviations
Astronaut and Space Operations

T-38
- Astronaut training

Super Guppy
- Oversized cargo

Shuttle Carrier
- Shuttle repositioning

Shuttle Trainer
- Shuttle simulation
Technology Development

Quiet Spike
-Sonic boom

Variable Thrust Vectoring

Autonomous Aerial Refueling
Airborne Science Research

**DC-8**
- Mid-altitude
- Payload: 30k lb

**P-3**
- Mid-altitude
- Payload: 15k lb

**ER-2**
- High-altitude
- Payload: 3k lb
Stratospheric Observatory for Infrared Astronomy (SOFIA)

B-747 SP
- Telescope assembly: 17 t.
- Cavity opening: 9’ dia.
Unmanned Aircraft Systems

Global Hawk Operations Center

Global Hawk

Mobile GCS

Ikhana
Commercial Aircraft Services

High Water Ice Content
- Instrumentation
- Flight regime

Reduced Gravity
- Overboard Venting
- \( \mu g \) tolerance
Summary

• Authority and responsibility is well established in the “Space Act” and Public Law

• Core Values
  – Constant attention to safety is the cornerstone upon which we build mission success.
  – Excellence to achieve the highest standards in engineering, research, operations, and management in support of mission success

• Specialized Capabilities
  – NASA employs some of the nation's top scientists, engineers, and other technical staff to inspire and serve America.
    • Professional, Engineering, and Scientific (60% of NASA's positions)
  – Maintaining installations around the country conducting day-to-day work in laboratories, on air fields, in wind tunnels, and in control rooms.
  – Internal controls to manage operational and safety procedures and oversight

• Unique Needs and Specific Operational Requirements
  – Solving challenges that still exist in our nation's air transportation system: emerging technologies, air traffic congestion, safety and environmental impacts
  – Space operations support related to human exploration in and beyond low Earth orbit
  – Seeking new knowledge and understanding of our planet Earth, our Sun and solar system, and the universe out to its farthest reaches and back to its earliest moments of existence

• Build on and leverage the core standards established by FAA regulations and certifications as well as DoD standards and specifications for aircraft operations