Integrated Aviation Systems Program
Overview
ARTR Meeting
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Director

Integrated Aviation Systems Program

Mission Program

Integrated Aviation Systems Program

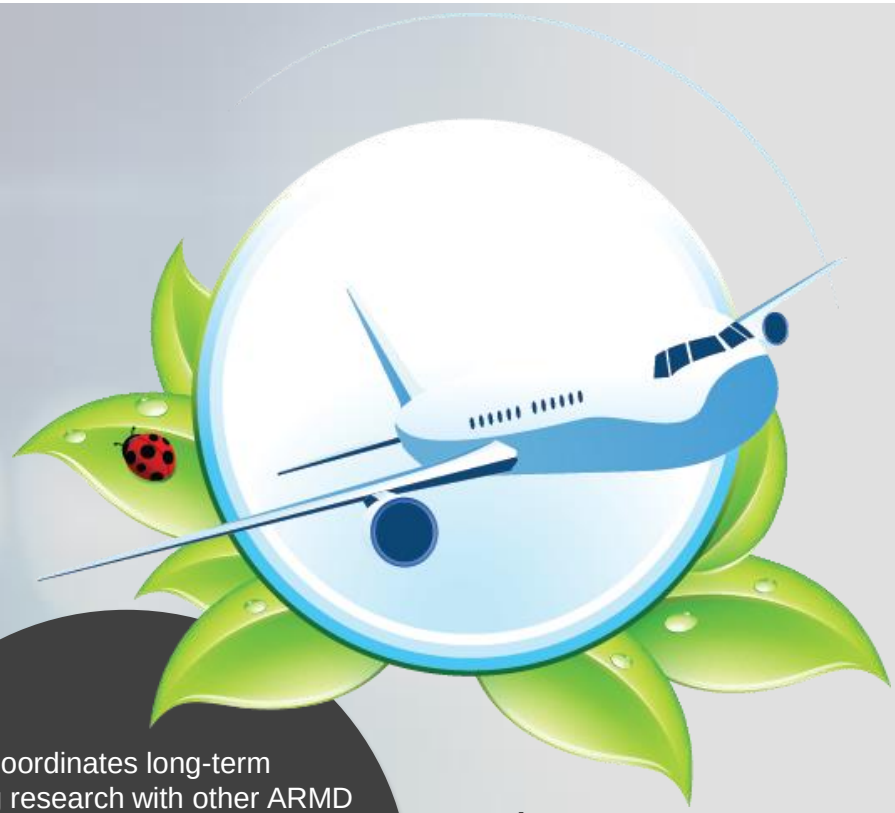
Conducts research on promising concepts and technologies at an integrated system level

Explores, assesses, and demonstrates the benefits of promising technologies in a relevant environment

Conducts research into environmentally responsible aviation and unmanned system integration into the national airspace

Supports flight research needs across the ARMD strategic thrusts, programs and projects

Completes flight demonstrations



Coordinates long-term ongoing research with other ARMD programs as done by the Integrated Systems Research Program. Continues the Environmentally Responsible Aviation and UAS in the NAS projects and includes the flight test portion of the former Aeronautics Test Program.

Projects

Environmentally Responsible Aviation

UAS Integration in the NAS

Flight Demonstrations and Capabilities

IASP Overview

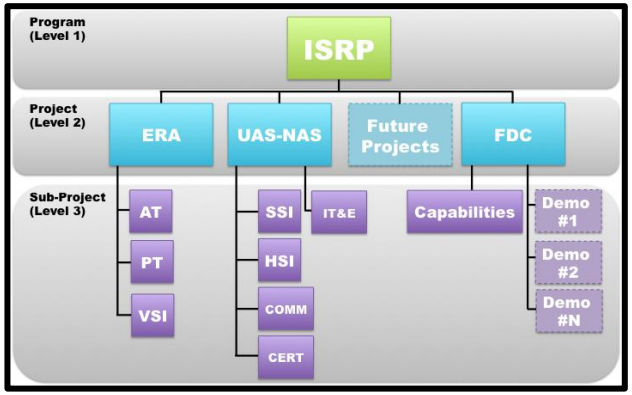
- ARMD desires to embed flight research throughout all research phases, not just a culmination activity. Flight research should be an integral part of the technical plans across all strategic thrusts.
  - To enable this a focus on innovation and flexibility will be critical. It should include importing good attributes of NASA's X-plane culture & industry best practices (e.g. Boeing's ecoDemonstrator with frequent flight demos and disciplined schedules)

IASP Overview

- Since flight test will be imbedded in all research phases, flight research is expected to occur in all ARMD programs
- **Integrated Aviation Systems Program** will focus on complex, integrated, multi-discipline flight test activities
  - These activities could be at any TRL level
  - The complexity and integration associated with these flight test require flight test expertise that ‘simple’ flight tests might not require
- Flight tests that do not meet the IASP criteria would be performed within their ‘home’ Programs.
  - These flight tests may be informed by and rely on IASP capabilities
  - They may be performed using IASP capabilities but will not be managed within IASP. For these activities, the ‘home’ Program and Project will be considered a customer for IASP capabilities
- IASP will identify flight test opportunities & work with ARMD Programs and others to take advantage of these opportunities

IASP Overview

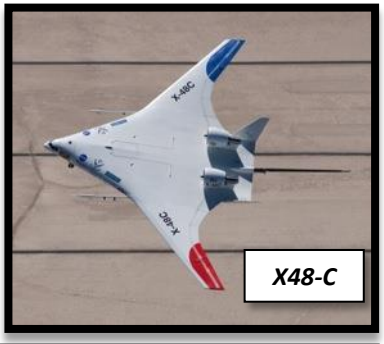
- No changes to ERA or UAS-NAS Projects
- Advanced Composites Project will be transferred to AAVP in FY15
- Future Projects would be ‘large’ IASP flight demonstration projects with significant visibility, requiring considerable amounts of money and time, e.g. Low Boom Flight Demonstrator
- Flight Demonstrations and Capabilities (FDC) Project will have two parts
  - Capabilities Sub-project will incorporate ATP Flight Test Project
  - Demo Sub-projects will be ‘smaller’ flight demonstrations that meet the IASP criteria but are focused with shorter durations, smaller budgets and do not require a full project to support.
- The FDC Project will:
  - Maintain the project processes and will have the strategic view
  - Work with ARMD Program(s) to identify potential demonstrations supporting the ARMD strategic plan.
  - Support other Program flight tests by helping to identify potential capabilities from the “universe”.
  - Work with the Capabilities Sub-project to align the capabilities with the strategic plan
- Capabilities and Demo Sub-projects will focus on tactical execution



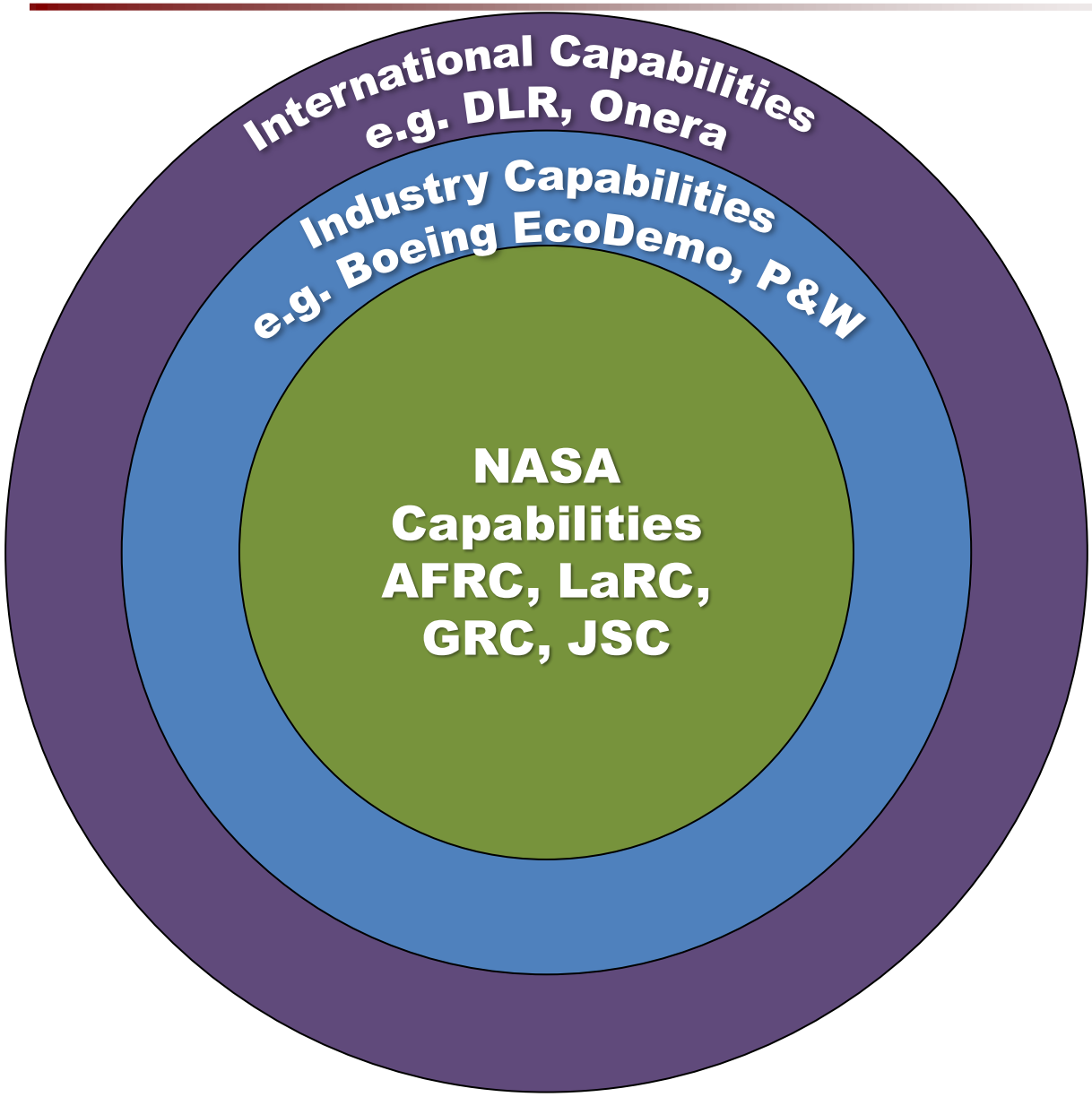
IASP Flight Tests

As mentioned earlier, Integrated Aviation Systems Program will focus on complex, integrated, multi-discipline flight test activities

- What does it mean to be a complex, integrated, multi-discipline flight test activities?
  - High risk flight tests with significant cost and visibility
  - Flight test objectives cross multiple disciplines or require multiple disciplines to achieve (aero, structures, propulsion, flight controls)
  - Involves modifications to flight critical hardware or software (engines, wings, tails, flight control software)
    - Examples: AFC ecoDemonstrator, DRE, ACTE, Re-wing an aircraft
  - Requirements for flight test sensors and/or data systems integration is complicated
    - Examples: HIWC
  - Flight test involves a number of assets (simulations and/or aircraft)
    - Examples: UAS-NAS Flight Test 3 & 4, ACCESS
  - One of a kind, never been flown, x-plane like vehicle platform
    - Examples: X-48, Low Boom Demonstrator
- Examples of flight tests that would managed and funded by their 'home' programs
  - Sonic boom studies, addition of sensor (ADS-B), addition of pod/pylon/flight test fixture, software/hardware that "rides along"



Flight Test Capabilities "Universe"



- As appropriate, ARMD will use flight test capabilities across NASA, Industry and International Partners
  - ARMD will not own all assets it uses
- NASA Capabilities will include assets across NASA centers
- AFRC will still have significant role.
  - AFRC will be the integrator/facilitator across the various capabilities
  - AFRC will provide the flight test expertise to ensure success

FDC Demo Selection

- IASP will work with the FDC Project to develop & execute the FDC Demo Selection Process in FY15. The decision whether or not to execute the process in FY15 will be informed by OMB Passback this fall.

- Potential Demonstration areas and timeframes assuming available funding
  - FY16 Demo – Focus on Environmental Flight Demonstrations
    - FY15 Selection & Planning (potential to use ERA Reserves)
    - FY16 Begin Execution of Demo Sub-Project
  - FY17 Demo – Focus on UAS / Early Autonomy Flight Demonstrations
    - FY16 Planning
    - FY17 Begin Execution of Demo Sub-Project
  - FY18 & Beyond – Potential Demos across all thrusts, use Strategic Portfolio Management Process as a method for determining IASP Demonstration Focus Areas

IASP Next Steps

- Update Program Documentation
  - IASP PCA (target September)
  - IASP Program Plan (target December)
  - IASP Risk Management Plan
  - IASP Change Management Plan
- Develop FDC Project Plan
- ACP Transition to AAVP & FTP Transition to IASP
- FDC Demo Selection Process Definition & Potential Process Execution
- FDC Project Manager Selection
  - FDC PM position will be advertised during FY15 across all centers. FDC PM will be in place by FY16.