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ICAO SEMINAR ON  
ALTERNATIVE FUELS 2017

ICAO Headquarters, Montréal, 8-9 February 2017



# Alternative Jet Fuel (AJF)

## Certification

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Federal Aviation Administration





# Acronym Listing (In Order of Appearance)

- **SLIDE 3:**
  - AJF: Alternative Jet Fuel
  - SAIB: Special Airworthiness Information Bulletin
- **SLIDE 4:**
  - CAAFI: Commercial Aviation Alternative Fuel Initiative
  - FT-SPK: Fischer-Tropsch Synthesized Paraffinic Kerosene
  - HEFA: Hydroprocessed Esters and Fatty Acids
  - SIP: Synthesized Iso-Paraffins
  - FT-SPK/A: FT-SPK with Aromatics
  - ATJ-SPK: Alcohol to Jet Synthesized Paraffinic Kerosene
- **SLIDE 6:**
  - HDCJ: Hydroprocessed Depolymerized Cellulosic Jet
  - HFP-HEFA: High Freeze Point HEFA
  - Virent SAK: Synthesized Aromatic Kerosene
  - ARA CHJ: Applied Research Associates Catalytic Hydrothermolysis Jet
  - Virent SK: Synthesized Kerosene
- **SLIDE 7:**
  - OEM: Original Equipment Manufacturer (aircraft or engine)
- **SLIDE 8:**
  - ASCENT: FAA Aviation Sustainability Center of Excellence



FAA Bulletin SAIB  
NE-11-56R2

# How Do We Certify AJF?

**IF:**  
New AJF Found to be Equivalent to Conventional Jet Fuel Using Industry Process

**THEN:**  
New AJF Approved to Use on Virtually All Existing Aircraft

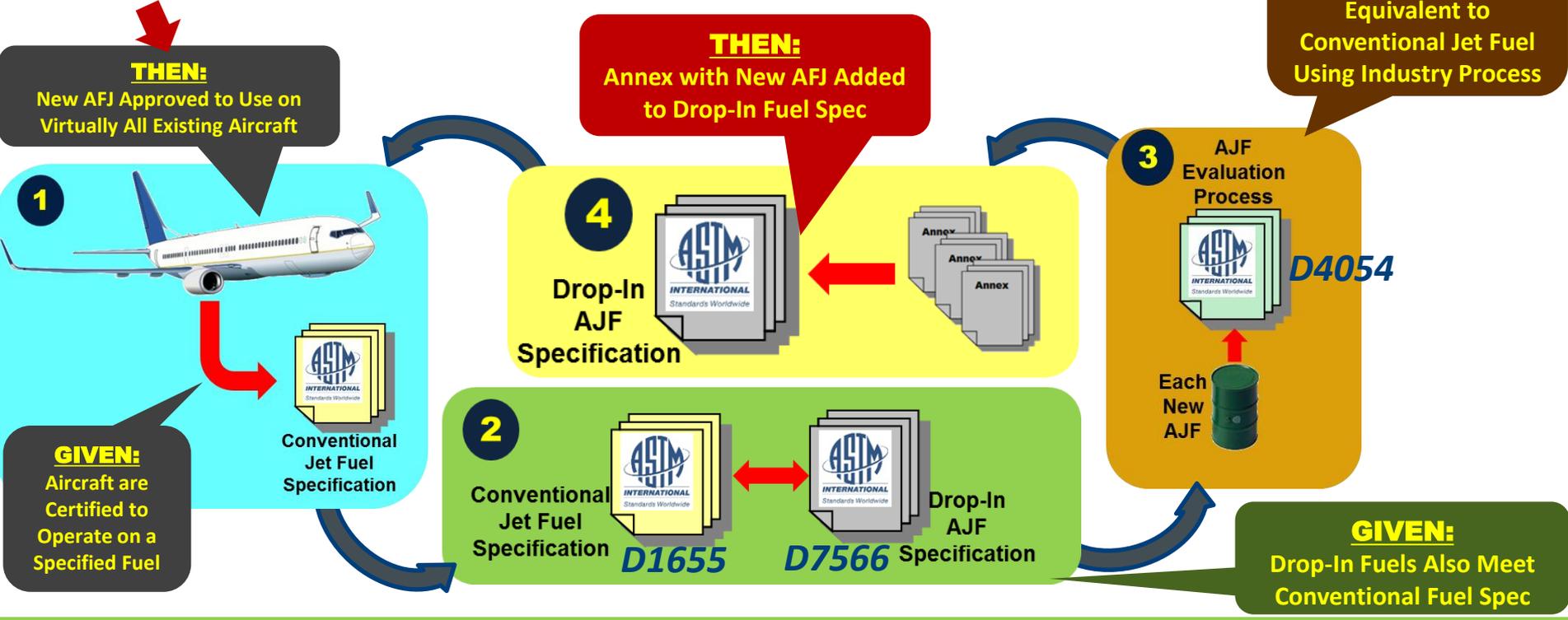


**GIVEN:**  
Aircraft are Certified to Operate on a Specified Fuel



**GIVEN:**  
Drop-In Fuels Also Meet Conventional Fuel Spec

**THEN:**  
Annex with New AJF Added to Drop-In Fuel Spec





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## A Decade of Progress D7566 Drop-In Fuel Spec



May 24, 2006  
CAAFI  
Established

A1

June 2009  
FT-SPK Annex A1

A2

July 2011  
HEFA-SPK Annex A2

A3

June 2014  
SIP Annex A3

A4

November 2015  
FT-SPK/A Annex A4

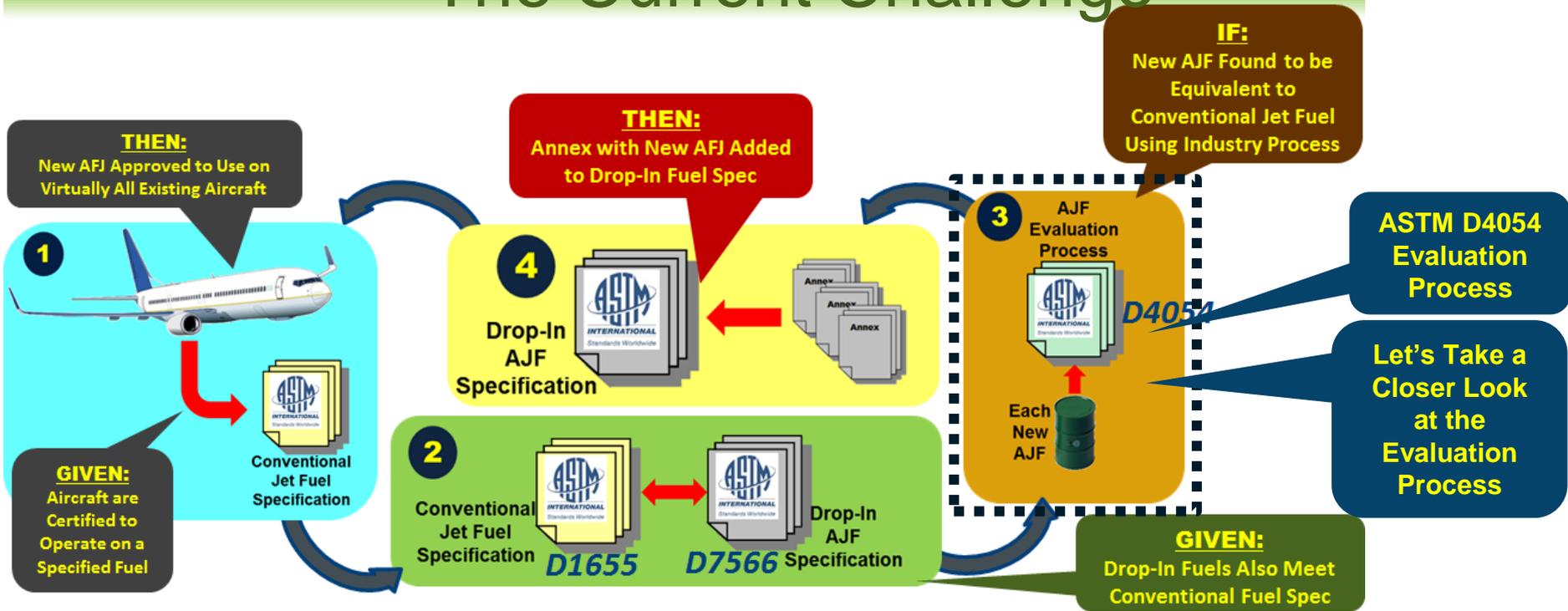
A5

April 2016  
ATJ-SPK Annex A5



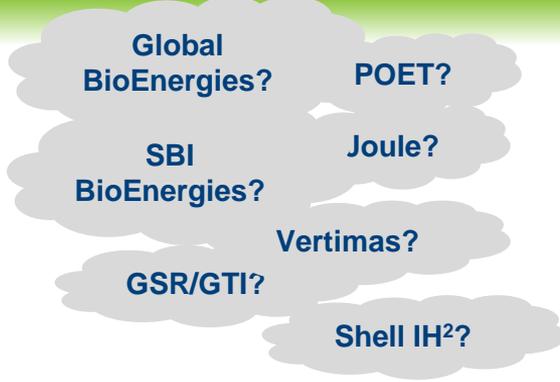


# The Current Challenge





# D4054 Qualification Process



Virent SK (Inactive)



Specification Properties

ATJ-SKA (Byogy, Swed Biofuels)

HDCJ (KiOR) (Inactive)

Fit-For-Purpose Properties

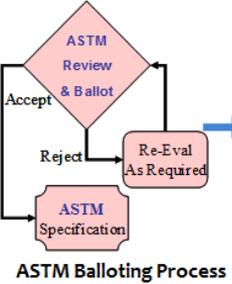
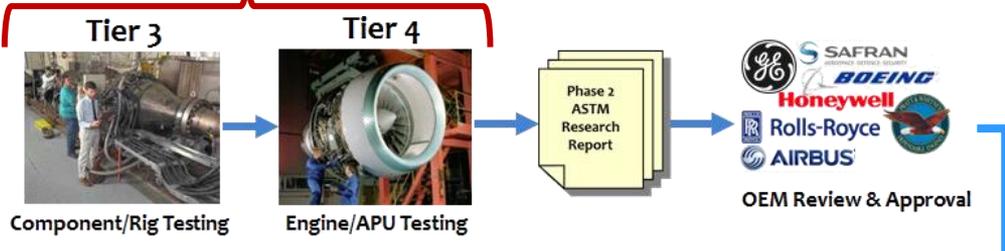
HFP-HEFA (Green Diesel)

Virent SAK

OEM Review & Tier 3 & 4 Requirements

ARA CHJ

ATJ-SPK (Ethanol) (LanzaTech)

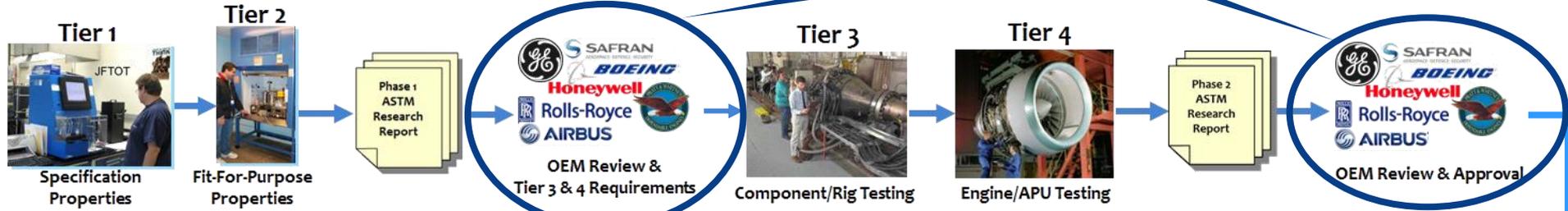


- Annex A1 FT-SPK
- Annex A2 HEFA
- Annex A3 SIP
- Annex A4 FT-SKA
- Annex A5 ATJ SPK (Isobutanol)

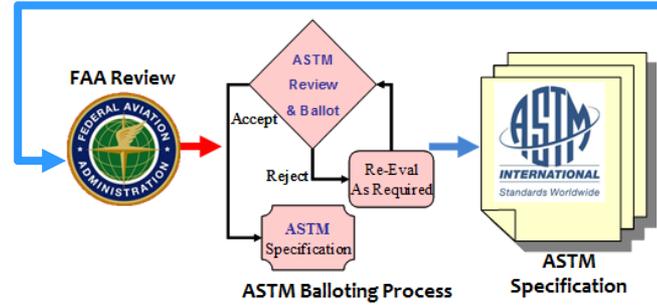


# OEM Review Process

## OEM Review Process



- Conducted by OEM Engineering/Technical Organizations:
  - Resource Intensive Process
  - Rigorous and Comprehensive Technical Review
  - Takes Time and Funding



**DRIVEN BY ENGAGEMENT/PRIORITY FROM AIRLINE COMMUNITY**



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# D4054 Clearinghouse Concept

Structured as a Cost Share Arrangement

FAA Seed Money Under ASCENT Center of Excellence

Accepts In-Kind Contributions (testing partners)

Also Accepts Direct Contributions

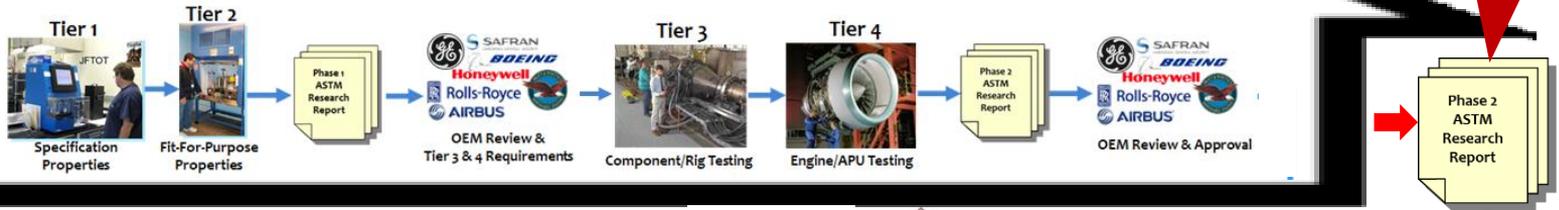
Stakeholder Engagement /Support Needed!

Final Research Report Out

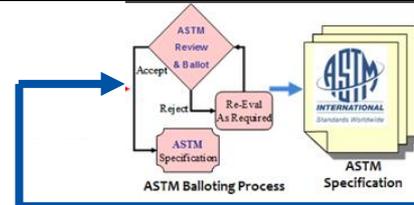
## University of Dayton Research Institute (UDRI)



Candidate AJF In



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# Policy Requests

1. Direct R&D resources and funding to the D4054 Clearinghouse to support the testing and evaluation of candidate alternative jet fuels.
2. Direct state-domestic candidate AJF producers to ASTM and support their qualification effort at ASTM.
3. Communicate the drop-in AJF certification concept as described in FAA SAIB NE-11-56R2 to domestic aviation regulatory agencies and issue similar communications to domestic aviation community.



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THANK YOU

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