

Integration and Coordination of the National Jet Fuels Combustion Program

University of Dayton

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Cost Share Partner: DLR Germany, University of Dayton, NRC Canada

Research Approach:

Evaluate the **operability impacts of alternative aviation fuels** across NJFCP institutions and allied partners

Test fuels were designed to stress several **key property effects in engines**

Diverse rigs evaluate test fuels at **varying conditions** and compare results to **OEM experience**

Model chemical kinetics and operability limits of fuels

Objective:

Streamline the evaluation and qualification process of novel Sustainable Aviation Fuel candidates

Project Benefits:

Development of **focused tests** to minimize operability impacts of SAFs *with prescreening*
Proposed testing to reduce and eventual elimination Tier 3 and 4 operability tests *with the Referee Rig*

Major Accomplishments (to date):

Evaluation of ~12 fuels across dozens of experimental devices
Analysis suggests bounding of **~8 properties** can account for **~90% of all observed variance**
Referee Rig operability limits at relevant conditions match all known OEM hardware trends
CFD matches operability trends for several fuels conditions
Process for custom chemical kinetics developed
AIAA BOOK PUBLISHED!

Future Work / Schedule:

Work with OEMs on next steps for SAF research prioritization