**ASCENT COE Notice of Funding Opportunity (COE-2016-39)**

**Project Title:** Naphthalene Removal Assessment

**FAA Project Manager**: Meng-Hui Lai (menghui.lai@faa.gov)

**Nominal Funding Level:** $200,000

**Period of Performance:** 1 year

**Deadline for response to this NFO:** April 15, 2016

**Project Description:**

The objective of this research is to gather and perform analyses regarding the reduction and/or removal of naphthalene from jet fuel in a refinery, and then to quantify the public health, global climate change, and economic impacts of reduction and/or removal of naphthalene in jet fuel.

Aircraft emissions impact the environment by perturbing the climate and reducing air quality, which leads to adverse health impacts, including increased risk of premature mortality. FAA seeks to better understand how different fuel components such as aromatics, sulfur, naphthalene, etc. can influence pollutant emissions. Recent emissions measurements have shown that the removal of naphthalenes, while keeping total aromatic content unchanged, can dramatically reduce emissions of particulate matter.

For this project, FAA seeks to understand the costs and benefits of the reduction and/or removal of naphthalene, and other complex aromatic compounds, from jet fuel produced from petroleum. Essentially there are two stages to this project.

In the first stage, the research team will examine refinery processes to reduce and/or remove naphthalene and other large aromatic compounds from jet fuel. The research team will need to evaluate the resources required at the refinery including infrastructure and inputs such as natural gas. The research team should consider a range of desired end states in terms of fuel composition including full removal of naphthalenes. The research team needs to develop information on the increased life cycle greenhouse gases and economic costs that accompanies the range of desired fuel compositions. The research team should also evaluate how the reduction and removal of naphthalenes would impact jet fuel sulfur levels.

After successfully assessing the reduction and/or removal of naphthalene in jet fuel, the second stage of this research will focus on understanding how the resulting changes in fuel composition impact air quality, global climate change, and the economics of fuel production. The research team should synthesize knowledge and emissions measurements to create relationships between particulate matter emissions and fuel composition. In order to estimate the environmental costs and benefits of reduction and/or removal of naphthalene in jet fuel, existing air quality and climate models should be employed in this research. The models should consider changes in both particulate matter and sulfur oxide emissions that could accompany the changes in fuel composition from the first stage of the project. This task should be performed in collaboration with other air quality and climate modeling efforts within ASCENT such that existing operational approaches are leveraged.

It is expected that the full project could require two years of effort. The first year would focus on the first stage and setting the stage for phase two which would be conducted during the second year. This NFO would fund the first year of effort.

Responses received before 04/15/2016 will be evaluated and one team will be requested to provide a full length proposal for further evaluation and possible funding to carry out the work.