

ASCENT Project 38

Rotorcraft Noise

Abatement Procedure Development



The Pennsylvania State University

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Cost Share Partner(s): Continuum Dynamics, Inc.

Objective:

- Compare effectiveness of procedures by class of helicopters (light versus medium)
- Develop coupling with FAA noise prediction tools
- Develop noise abatement flight maneuvers for medium-size aircraft and compare with light vehicles
- Investigate the modeling of shrouded rotor noise

Project Benefits:

Quick and accurate models of various untested flight maneuvers will allow for optimized model-specific noise abatement guidance for pilots.

Research Approach:

- **Validate** noise prediction system for noise abatement procedures/maneuvers
- **Analyze** noise abatement procedures
- **Model** noise to demonstrate noise reduction advantages of certain flight maneuvers
- **Evaluate** noise abatement procedures against each helicopter category
 - Determine effectiveness of abatement procedures
 - Consider if a category is representative of a helicopter's classification

Major Accomplishments (to date):

- Compared noise predictions between aircraft of different weight classes (light and medium)
- Analyzed noise differences caused by effective flight path angle for S-76D
- Created integration tool for PSU-WOPWOP and DOT Volpe AAM to enable direct data transfer to AAM
- Refined 2017 aircraft models for more accurate predictions

Future Work / Schedule:

- Expand comparison of noise predictions between aircraft of different weight classes (light and medium) for a variety of flight conditions
- Create a model for shrouded rotor noise
- Test the Advanced Acoustics Model integration tool for a variety of cases