E&E REDAC
Subcommittee

Noise Research

Presented to: E&E REDAC Subcommittee
By: Rebecca Cointin, AEE-100
Date: August 30, 2016
Outline

• Noise Roadmap
• Aviation Noise Impact on Annoyance – Survey Update
• UAS – Certification and other Environmental Considerations
• Quantifying Noise Impacts and Tracking Noise Trends
Goal of Noise Research

- Impacts
- Modeling
- Certification
- Mitigation

Policy and/or Guidance

Tool Development
FY16 Funded Projects

Impacts
- Noise Annoyance Survey Methodology Review
- PBN Research on supplemental metrics
- National Parks Noise Research - Dose Response Research
- Noise Inventory Rerun

Noise Survey
- Noise Health Impacts
- Pilot study on aircraft Noise and Sleep
- Investigation of Possible Revised NEPA Significance Definition

Modelling
- Quantifying uncertainties in predicting aircraft noise in real-world situations
- Noise Power Distance Re-Evaluation
- AEM Update for AEDT Consistency
- Helicopter Noise Measurements

Certification
- Identification of noise acceptance onset for noise certification standards of supersonic airplanes
- Acoustical Model of Mach Cut-off Flight
- Noise Certification Validation and SuperFAR development

Mitigation
- NoiseQuest
- Rotorcraft Noise Abatement Procedures
- FICAN
- Investigation of ASTM E966 Correction Factors
- Investigation of efficacy of sound insulation for changes in noise level eligibility requirements
- Investigation of noise mitigation possibilities other than traditional sound insulation treatments

AEE Funded
APP Funded
Noise Survey Update
Noise Survey Status

• Survey and analysis is scheduled to be completed early 2017

• Survey is being completed in waves (both phone and mail). The first wave was mailed out on Fall 2015

• July 2016 Statistics:
  – Mail - 8,173 mail completes (target 10,000; 72% of goal)
  – Phone - 1,569 telephone completes (target 2,140; 73% of goal)

• At completion of survey and analysis, FAA will begin to consider policy implications
  – Consult with additional Federal Agencies and other stakeholders
  – Chance for public involvement
Related Research

• Impact of aviation noise such as sleep and cardiovascular disease
• Efficacy of sound insulation
• Alternative Noise Mitigation and Noise Abatement Processes
• Understanding potential NEPA thresholds

Many FY16 projects are geared toward supporting the updated policy decision on DNL 65 dB
UAS – Certification and other Environmental Considerations
Noise Certification

• FAA has currently exempted UAS from noise certification
  – Section 333 and Part 107

• As rules continue, need to decide what will be the certification framework for all UAS
  – For UAS of a certain size, current framework is infeasible from a flight perspective

• Exploring a risk-based approach to noise certification

• Data is needed to develop new frameworks
Environmental Challenges of UAS

• Clarity needed in roles and responsibilities regarding environmental considerations of UAS

• Necessary data and resources to comply with NEPA and other environmental laws

• Physical intrusion, annoyance, new aircraft type and privacy concerns usually become noise concerns

• Public Acceptance: Although many people have embraced the potential benefit of UAS, others have expressed concerns about the possible impact on the environment, on wildlife, on traditional cultural practices and on personal privacy
### AEE Research on UAS

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<td>Conduct Additional Measurements for a wide range of vehicle types</td>
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<td>Assess environmental impact consideration under NEPA</td>
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<td>Develop noise certification framework</td>
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<td>Consider risk-based noise standards for UAS</td>
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<td>Develop environmental analysis capability that is unique to UAS (i.e. specific NEPA guidelines or modeling capabilities for UAS)</td>
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- **Data collection to determine UAS noise certification framework**
  - Examining weight limitations
    - Collaborating with ASSURE (UAS Center of Excellence) to test a UAS
    - Coordinating with Department of Defense (Air Force at Corning) to examine a scheme for low risk UAS
    - Leveraging NASA tests – have collaborated on two tests with them looking at equipment and procedures

- **Exploring potential for the need to model UAS**
- **Determine additional analysis to support NEPA and other environmental laws**
Quantifying Noise Impacts and Tracking Noise Trends
The Historical Record:
Order of Magnitude Noise Exposure Reduction Despite Traffic Growth

Population

Enplanements
Noise Trend

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Calendar Year

Target vs. Actual
Increasing Noise Trend

• Growth in operations, including nighttime operations
• Improved modeling
  – Discussion this afternoon
  – Updated noise “decks” used for annual inventories
  – Improved runway usage information for some airports with the introduction of ASDE-X
  – Utilizing the latest versions of AEDT
• Growth in population
Noise Trends Beyond 2018

- Examining current noise trend
- Leveraging Noise Trends and Goals Analysis (briefing later today)
- Reviewing forecasted growth
- Considering potential noise impacts, such as annoyance, sleep, and cardiovascular health