



NASA / FAA eVTOL Crashworthiness Workshop Series: Virtual Meeting #4: *Current Research in eVTOL Crashworthiness from a Government and Academic Perspective*

April 13, 2021



Justin Littell Ph.D.
Research Aerospace Engineer
Structural Dynamics Branch
NASA Langley Research Center
Justin.D.Littell@nasa.gov

Joseph Pellettiere Ph.D.
Chief Scientific and Technical Advisor
Crash Dynamics
FAA Aviation Safety
Joseph.Pellettiere@faa.gov



Introduction – Fourth Workshop



- All content on NARI
 - <https://nari.arc.nasa.gov/crashworthiness>
 - First provided the historical perspective and overall regulatory considerations
 - Second considered certification requirements
 - Third reviewed the considerations for vehicle crashworthiness from the perspective of the Department of Defense
- Examines some of the current crashworthy research in eVTOL applications



Meeting Logistics

- Speakers and Moderators are on TEAMS meeting
- Participants will be using YouTube link available on website
- Participants can ask questions using ConferenceIO link available on website
- NASA or FAA will introduce each speaker and ask questions to that speaker at the end of their presentation
- Speakers will screen-share their presentation on the TEAMS meeting
- Meeting website: <https://nari.arc.nasa.gov/crashworthiness>

NASA / FAA Workshop 4 Agenda – April 13, 2021



Speaker	Organization	Time (Eastern)	Presentation Title
Justin Littell / Joseph Pelletiere	NASA / FAA	12:00 – 12:15	Current Research in eVTOL Crashworthiness overview
Francisco Capristan	FAA	12:15 – 12:45	Current FAA AAM/UAM Research
Amanda Taylor	FAA Civil Aerospace Medical Institute (CAMI)	12:45 – 13:15	CAMI Rotorcraft Research
Justin Littell / Jacob Putnam	NASA Langley Research Center	13:15-13:45	NASA Crashworthiness Technical Challenge Overview
Break		13:45-14:00	
Gerardo Olivares	National Institute for Aviation Research (NIAR)	14:00-14:30	Integrated Safety for EVTOL Crashworthiness : from Conceptual Design to Certification
Matthias Waimer	DLR, German Aerospace Center	14:30-15:00	Conceptual design phase study on eVTOL Crashworthiness
Luigi Di Palma Francesco Di Caprio Marika Belardo	CIRA, Italian Aerospace Research Center	15:00-15:30	NextGen Civil Tiltrotor Crashworthiness Approaches

The Need for Crashworthiness in eVTOL Vehicles: *Why Now?*



- Now is the time
 - Early in the vehicle development cycle
 - Will pay great dividends in the future
- Expect that accidents will happen
 - Protect the occupants to ensure continued growth and acceptance
- Current regulatory framework is based upon other designs
 - This may change in the future depending on performance
 - Attention to system level safety now, will prepare for the future



Additional Meetings

- Potential 5th workshop in formulation. Summer 2021, OEM and supplier focused
- Onsite working group meeting tentatively at VFS Transformative Vertical Flight, January 2022
 - Main session
 - Summary of the previous workshops
 - Overview of the ongoing research identified
 - Breakout session
 - Discussion of research and gaps in eVTOL crashworthiness
 - eVTOL crashworthiness roadmap
 - Development of plan forward



Going Forward

- Creation of an eVTOL Crashworthiness working group
 - Will solicit input at VFS
 - Yearly working group meeting to review status of various research plans/projects that have been identified over the various organizations
 - Status against the roadmap
 - Various regulatory updates
 - Stakeholders with various funded projects can provide updates
- NASA TM/FAA report summarizing all workshop presentation material along with some opening and concluding remarks