



U.S. ARMY
RDECOM

Advanced Analysis Capabilities for
Future Vertical Lift Aircraft

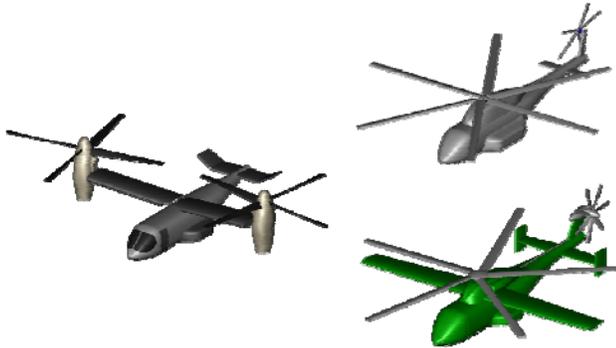


S&T Campaign: Assessment & Analysis
Testing, Modeling and Simulation

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Research Objective

- Develop analysis capabilities to assess the complex rotorcraft design of the Future Vertical Lift airframe.
- New, more complex analysis tools required to address fire initiation, complex rotor designs, and advanced composite structures.



Conceptual Graphic Illustrations of Future Vertical Lift

ARL Facilities and Capabilities Available to Support Collaborative Research

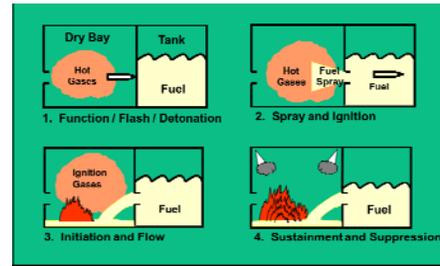
- Ballistic vulnerability analysts and engineers.
- Ballistic experimentation capability to explore fuel fires and material ballistic performance characterization.
- Software development branch to integrate new models into existing analysis tools.
- Material prototyping capabilities at ARL's Weapons & Materials Research Directorate.
- Aerodynamic modeling expertise through ARL's Vehicle Technology Directorate.

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Expertise in combustion physics and modeling
- Aerodynamic modeling of advanced rotor systems
- Specialized knowledge in composite material penetration physics
- Expertise in physical properties of complex composite structures

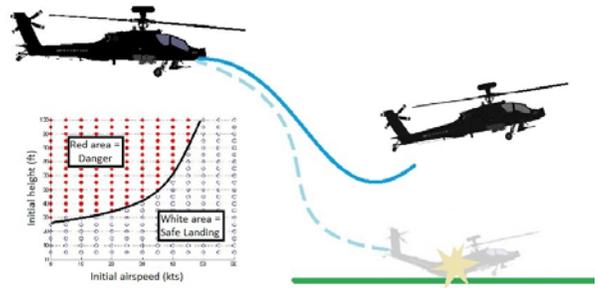
Challenges

- Fire prediction model that utilizes CAD geometry to better simulate specific conditions of internal aircraft environment.



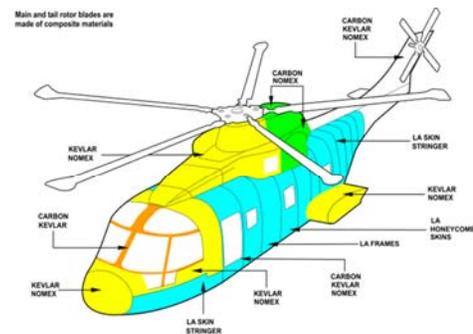
Dry-bay Fire Process

- Develop analysis model to predict continued flight operations under degraded power conditions for complex rotor systems.



Current DESCENT Model

- Establish material characterization data and ballistic penetration equations for advanced composite structures.



Advanced Composite Materials in a Helicopter