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.

Challenges
• Fire prediction model that utilizes CAD geometry to better simulate specific conditions of internal aircraft environment.
• Develop analysis model to predict continued flight operations under degraded power conditions for complex rotor systems.

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

Conceptual Graphic Illustrations of Future Vertical Lift

Dry-bay Fire Process

Current DESCENT Model

Advanced Composite Materials in a Helicopter