



# VirginiaTech

College of Agriculture and Life Sciences  
Department of Plant Pathology, Physiology, and  
Weed Science

**David G. Schmale III, Ph.D.**

Associate Professor  
403 Latham Hall  
Virginia Polytechnic Institute and State University  
Blacksburg, VA 24061-0331  
Phone: 540/231-6361 Fax: 540/231-7477 E-mail: dschmale@vt.edu

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RE: Airworthiness Statement for Penguin B UAV used in the Schmale Laboratory at Virginia Polytechnic Institute and State University

The purpose of this memo is to document the certification process used to certify the airworthiness of the Penguin B unmanned aerial vehicle (UAV) outlined in this COA application. These UAVs are used solely for research purposes and are operated in uninhabited areas at Virginia Tech's Kentland Farm. Each UAV platform is carefully inspected for airworthiness at multiple stages during the assembly of the aircraft, immediately before flight, and immediately following flight. The Penguin B UAV platforms are purchased through a vendor as an almost-ready-to-fly kit. Following receipt of the platform at Virginia Tech, all pieces are carefully inspected for integrity and quality of construction. These inspections are conducted by an RC pilot with over five years experience in building RC platforms. Each servo is individually tested for the performance and range of motion, and the pushrods and control surfaces are individually tested and calibrated in the laboratory prior to and during installation. Propellers are balanced to performance standards and each engine is broken-in on the ground with two 21 oz tanks of fuel. Immediately prior to flight, each UAV goes through a detailed pre-flight check, which includes a detailed airworthiness inspection of control surfaces, battery power and function, engine and fuel inspection, and a radio check for range and potential interference issues. After flight, detailed logs are maintained for each UAV including the flight times, hours on engine, repairs, and regular performance and structural evaluations. Associated documents in this COA application further describe the hazard analysis, safety guidelines, and standard operating procedure for our Penguin B UAV platform.

Sincerely,

David G. Schmale III, Ph.D.

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