MASTER OF SCIENCE
IN
AERONAUTICAL ENGINEERING

TIME DOMAIN VALIDATION OF THE SIKORSKY GENERAL HELICOPTER (GENHEL) FLIGHT DYNAMICS SIMULATION MODEL FOR THE UH-60L WIDE CHORD BLADE MODIFICATION

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Helicopter design at the Sikorsky Aircraft Corporation is aided by the use of the Sikorsky General Helicopter (GenHel®) Flight Dynamics Simulation Model. Specifically, GenHel output is used by both handling qualities and maneuver loads engineers as a predictive design tool. Inherent in the use of an analytical model is the requirement for validation. This report seeks to validate the GenHel® flight dynamics simulation models used in the design of the UH-60L Wide Chord Blade (WCB) modification. Initially, comparisons are made between the current analytical models and flight test data for selected trim flight conditions and dynamic maneuvers. Based on the correlation of the data, modifications are made to the analytical model where necessary. The modified analytical model will be validated through a final comparison with test flight data. The goal of this report is to validate the use of Sikorsky's GenHel® flight simulation program as an analytic predictive tool in the design of the WCB modification and identify any areas where improvements could be applied. Validation of the WCB GenHel model serves two purposes. First it confirms the ability of GenHel to model the flight dynamic response of the UH-60L with the WCB modification. Second it confirms the predictive loads forwarded to the structural engineers during the design phase of the WCB.

DoD KEY TECHNOLOGY AREAS: Air Vehicles, Modeling and Simulation

KEYWORDS: Helicopter Dynamics, Mathematical Modeling
