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Parametric Specific Fuel Consumption Analysis of the PW120A Turboprop Engine

The recent volatility in the price of fuel, increasing public concern over the impact of aviation on the environment, particularly CO_2 emissions and more currently, the economic downturn are driving factors for airlines to review and where possible, further optimize their flight operations by reducing fuel burn and associated emissions.

The Pratt & Whitney Canada PW100-series turboprop engines have been in service now for almost twenty-five years and they continue to have strong commercial success in the regional aircraft market, a testament to the efficiency and reliability of the original design.

This paper evaluates the sensitivity of the Specific Fuel Consumption (SFC) of the PW120A engine as installed on the Dash 8-100 (Q100) aircraft as a function of various operational parameters such as throttle setting, aircraft altitude, Static Air Temperature (SAT) and bleed air function. The effect of engine wear on performance is also addressed. The analysis is based on a thermodynamic model of the turboprop developed and validated by Specific Range Solutions Ltd.

<u>Please note</u>: This abstract has been submitted for consideration for presentation at the 17^{th} Canadian Aeronautics & Space Institute Propulsion Symposium to be held in Kanata, Ontario, May 5 – 7, 2009.



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