### Exploratory Wind Tunnel Aerodynamic Research
Winter 2013-14

**Supplementary Notes:**
Several research reports for testing of de/anti-icing technologies were produced for previous winters on behalf of Transport Canada. These are available from the Transportation Development Centre (TDC). Several reports were produced as part of this winter’s research program. Their subject matter is outlined in the preface. This project was co-sponsored by the Federal Aviation Administration.

**Abstract:**
This objective was met by conducting a series of full-scale tests using the NRC open circuit wind tunnel to examine the flow-off properties of anti-icing fluids contaminated with various forms of simulated freezing precipitation to investigate several recent industry operational concerns; this work was completed in conjunction with the ice pellet research being conducted at the NRC PIWT.

- **EVALUATION OF AN AIRFOIL PERFORMANCE MONITOR:** The testing conducted provided Marinvent with a platform for evaluating the APM unit, the details of which remain internal to Marinvent. Initial observations saw fluid get into the pressure probes of the APM unit; however, the extent of the effects should be further investigated by the manufacturer. Future testing should be done with a wireless unit to minimize aerodynamic effects of passing wires over the wing.

- **AERODYNAMIC TESTING OF ICE PHOBIC COATINGS:** A test plan was developed and conducted during the winter of 2013-14 to gain new insight into the potential applications of these coatings for aircraft operations, and to continue the research to include newly developed coatings. As part of this test plan, it was recommended that testing continue to investigate the effects of these coatings on de/anti-icing fluids from both a HOT and aerodynamic perspective.

- **EFFECT OF COOLING SYSTEM ON TESTING PROCEDURES:** In general the concept has shown promise and with some effort to isolate the problematic areas of the system, the cooling system can become a critical tool for testing and will allow greater flexibility.

**Key Words:**
Data Log, Airfoil Performance Monitor, Aerodynamic testing of Ice Phobic coatings, Type I Fluid, Ice Pellet dispensers, Cooling System, Heavy Contamination

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**Distribution Statement:**
Limited number of copies available from the Transportation Development Centre

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Unclassified

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