Report on Potential Enhancements to the Forecast Inflight Icing Algorithms

Executive Summary

Flight into atmospheric conditions conducive to airframe icing can potentially be hazardous, as the accretion of ice onto the airframe and instrumentation can affect aerodynamics, weight, and avionics, impacting safe control of the aircraft. The Met Office routinely generates forecasts of icing potential and severity, the latter provided as a global gridded hazard product constituent in the WAFS provision. The presence of large water droplets in sub-zero temperatures pose a high icing risk, for example during freezing rain, but this situation is not currently represented in the Met Office icing severity and potential forecasts. This report outlines how the forecasts could be improved to include this risk. Modified candidate icing algorithms are proposed to enhance the icing forecast capability in supercooled large drop scenarios, and an initial case study demonstrates significant improvement in identifying high icing threat during a recent widespread freezing rain event across Europe. An extended trial will follow, including objective verification and further case study analyses. Pending the results, recommendations will be made regarding operational implementation and capability pull-through into the WAFS provision.