912 carb icing incident report

Background

Whilst flying my aircraft on Saturday 23rd June with a group of aircraft I encountered carb icing problems in-spite of the Carb Heat being fully engaged. (NOTE all the aircraft including my own have Rotax engines, all with different carb heat systems, only my aircraft encountered problems.)

I was at 6500 ft over Esk valley (South Island) and was unable to descend to prepare for landing at an Ag Strip due to the carb-airbox temperature rapidly decreasing when I reduced the power. I noted the engine had started to shudder and immediately increased power.

I opened the throttle to 5000 rpm to restore heat to the engine/carbs and tracked back to Rangiora. On route I was at 6500 feet heading over the Puketeraki Ranges soon to descend into the Lees Valley to LL5500ft. I needed to reduce power to descend when I did this the engine shuddered again and this time inspite of careful reduction in RPM the engine stopped.

I continued to fly the plane and set the aircraft up for an optimal glide approach into Lees valley at the same time checking all the instruments in the cockpit were in the green including checking that I was not losing fuel. I was confident that the engine stopping was due to CARB Heat issues.

I then executed an engine re-start which restored full power and increased my rpm to 5000 to increase heat to carbs and successfully returned to Rangiora Airfield with only one more incident of a very minor engine shudder on a very slow and high power descent into the Loburn area LL2500. As I tracked the Loburn area to the field I noted the carb heat temperature restored to 22 degrees and engine was running satisfactorily.

Issue

Savannah S standard manufacturer's carb heat airbox system with full carb neat engaged was unsatisfactory and unable to maintain optimal carn temperature in winter conditions on a fine sunny winters day with outside temperature at minus-2 degrees with potential for icing conditions.

NOTE The group of aircraft included two other Savannahs, both of which have modified carb heat systems which maintained their air box temperatures over 20deg as opposed to my Savannah standard manufacturer's carn heat system which did not maintain a stable airbox temperature particularly at altitude.

Action taken

FMIP Fuel Mixture Ignition checks and Partial Power restoration plan and action. Including setting up the aircraft for an optimal glide path into the Lees Valley at 500ft per minute.

I did not make a MayDay or Pan call as I had restored the aircraft back to full power and I kept the RPM at 5000 on the return trip to Rangiora very slowly descending (at high power) whilst monitoring the airbox temperature.

I was prepared to make a precautionary landing if required and maintained the best altitudes I could to keep my options open on return.

Manufacturer to be advised that carb heat system when fully engaged is insufficient to maintain carb heat integrity in NZ winter conditions at minus temperatures with potential icing conditions

and needs to be upgraded for the safety of all Savannah aircraft.

Obviously there is a limit to how well this carb heat system works (I flew this aircraft all last winter with no issues) but I certainly would not trust it in similar conditions again. I will be upgrading the carb heat system to match the other Savannahs and will forward photos at a later stage