SC-108 Rockcliff Ice Wagon Aircraft, circa 1950

(5 items)

This collection contains an original photograph of the Rockcliff Ice Wagon aircraft. Also included are color digital copies of a postcard (front and back) commemorating the first jet mail in the Avro Jetliner and two digital paper copies of photographs, one of the Avro Jetliner prototype and one of G.P. Siddall, the ice guard project engineer at Goodyear Tire & Rubber. All are circa 1950.

Here is the information included with the donation, provided by Gerald P. Siddall:

This is the "Ice Wagon" which was a test ship fitted out to do work on icing protection systems. It had a special vertical fin on which test samples could be installed and performance observed during flight. This was a Douglas DC6 (as I recall) manufactured in Canada by Canadair (as I recall). Note the British engines.

The ship was operated in conjunction with tests by the Low Temperature Test Laboratory of the National Research Council in Ottawa during the late 1940s and early 1950s. At that time in the Cold War the threat was manned bombers coming over the Arctic – so Canada was on the front line of defense. One of the few icing wind tunnels was also operated by the Low Temperature Laboratory.

Extensive work was done in Canada to develop ice protection systems of the pneumatic boots and Goodyear Tire & Rubber provided electrothermal boots. At the time I was Project Engineer at Goodyear for design of electrothermal "Iceguards" and made many trips to Canada to observe wind tunnel and flight tests.

Data from these tests prompted electrothermal "Iceguards" to be used on the Avro "Jetliner" so Goodyear manufactured and installed them on a prototype ship. The "Jetliner" was the first jet powered passenger ship designed and built in Canada or USA.

But the Cold War took higher priority and Avro was directed to design and build an all weather interceptor. So work on the "Jetliner" was terminated with only a prototype flying, never to be resumed. By the time Avro got the CF100 into production US aircraft companies had jet passenger ships on stream.

An all weather ship must be able to fly in icing conditions. Most all ice protection systems are designed to avoid icing conditions. It is not practical to pay the cost in dollars, weight or complexity to do otherwise on most ships. But an all weather interceptor was specified. As with the "Jetliner" the Canadians selected electrothermal "Iceguards" since this ship was to fly into icing and perform well in pursuit of manned bombers.

So a completely automatic ice protection system was designed. It included an ice detector by Applied Research in Toronto, control panel by Dynamic Controls in Hartford, and "Iceguard" electrothermal boots by Goodyear in Akron. It was probably the first fully automatic system

whereby the pilot had simply an "on-off" switch and could leave it "on" at all times during flight. The system would turn itself on as needed without pilot monitoring. Of course the CF100 needed to have two large AC generators to furnish power when needed for ice protection.

So – enough for history. On to the "Ice Wagon". Please note in photo the badly dented fuselage in line with the props. This ship flew very often in ice and the de-iced props threw chunks of ice at the fuselage as it was shed from the blades. That area of the fuselage had a heavy skin to withstand the impacts. But the sound was like that of a machine gun. Just forward of the test fin there are ports to observe and record performance of the test boot installed on the fin. Wing and tail leading edges had pneumatic boots. The ship was flown in natural icing as well as behind an ice spray tanker. Test sample boots were first tested in the wind tunnel for preliminary data. Then design was adjusted prior to flight tests.