ICE on the VIKING

Important Flying Tests : Results and Remedies : Resumption of Services

AFTER four months of inactivity Vikings have now, as we briefly recorded last week, regained A.R.P. approval for operation in icing conditions on all B.E.A.'s routes. Their precautionary withdrawal from service was a severe blow, but it may also well prove indirectly to have been of great advantage to the British aircraft industry. The findings of what must be the most extensive series of flying tests in severe icing conditions, which have been conducted as a result of their withdrawal, are to be made available to all manufacturers by the Vickers-Armstrong company.

Three things are required of a modern aircraft should icing be encountered: the ability to fly and be handled normally—perhaps with some increase of power—with ice on surfaces, the ability, with the aid of its de-icing equipment, to get rid of any ice which has formed and, in anticipation, the ability, with the aid of its de-icing equipment, to prevent ice from forming at all.

Being the most important problem, the aerodynamic one was tackled first. It had been known for some time that the aerodynamic one was tackled—first. It had been known for some time that the aerodynamic one was tackled—first.

A second factor which bears on the aerodynamic problem is the asymmetry of the slipstream resulting from airscrews rotating in the same direction. Handed airscrews are not a practical proposition, chiefly because of the duplication of spare engines and components which would be entailed. The port horn balance on the Viking has from the start been smaller than the starboard one because of the destabilizing effect of the slipstream acting on the port side only. On the modified Vikings, which will go back into service, it is intended to make them heavier, while the increased gearing of the tabs has rather the reverse effect under normal conditions. The aim successfully achieved, has been to obtain less balance but the same stability under all conditions.

One effect of the modifications to the tailplanes is the asymmetry of the slipstream which acts on the port side only. On the modified Vikings, which will go back into service, it is intended to make them heavier, while the increased gearing of the tabs has rather the reverse effect under normal conditions. The aim successfully achieved, has been to obtain less balance but the same stability under all conditions.

Possible effect of insufficient flow of de-icing fluid. The next stage may be a build-up of upper and lower ice sections to a three-pronged formation.
Ice on the leading edge of the starboard tailplane. The upper indicator is free but the horn balance is heavily coated.

A large "cabbage" has formed on the starboard elevator horn.

stational ice formations, but that it would prevent some icing in mild ice conditions. The aircraft was also found to fly safely on our engine (starboard engine) without carrying ice, and on test climbed at 120 ft/min at about 32,000 lb A.U.W.

It should be mentioned that for the Viking in practice. The shape of airframe (nose and rudder) and the fuse (or other tail surfaces) their flow will be doubled. For ice prevention the modified T.K.S. system is now satisfactorily.

Temporary measures to increase the de-icing fluid capacity on the European Vikings have necessitated the use of one system fuel tank of 38 gallons capacity. As soon as new de-icing fluid tanks can be made and fitted, the nacelle fuel tank will revert to its original purpose. Airscrew icing gave no trouble to any time, and no ice was seen on newly-feathered blades. That ice did form on the blades, however, was proved by dents in the fuselage opposite their tips, and by the considerable hammering noise it made on impact.

Engine icing also gave no trouble, and the internal hot-air intake worked well. Use of hot air for landing has, however, been incorporated in Viking landing drill. This has little effect on power output.

Resumption of Operation

Speaking at a recent conference, Mr. G. d'Erlanger, managing director of B.E.A., said that numbers of Vikings would be back in service by April 20th. The modifications had to be incorporated in all B.E.A.'s Vikings, the production line had to be got going again. B.E.A.'s pilots had to be checked-out again after four months off Vikings, more proving flights would be made as a precaution.

The first two test flights, made on January 25th and 26th with short-nosed Viking G-AHPG, Capt. James and Capt. Summers, chief pilots of B.E.A. and Vickers respectively, Mr. Edwards, chief designer, Mr. Black of the Air Registration Board, and Radio Officer Cox of B.E.A. flew. Capt. James and his radio officer flew on every subsequent occasion but were, on occasions, accompanied by W.C. Lowdell, Vickers test pilot, Mr. Richards, also of Vickers, and First Officer Crawford of B.E.A.

Elements in each horn gap and on leading edge of horn and starboard horn. Tank capacity 73.8 gal. Duration 2 hr 54 min or 37 mm. (Airscrew and T.K.S. Controller giving "normal" or "emergency" flow) One tank (15.4 gal) in starboard inner wing.

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