PREPARE TO DITCH

FOLLOWING the universal adoption of turbine engines in air transport for all but the very smallest aircraft, and the vastly improved powerplant reliability that has followed as a result, the argument is now frequently voiced that because of this improved safety factor and the higher speeds and longer ranges of modern over-ocean transports, there is a case for reducing the amount of mandatory survival equipment to cater for the ditching case.

On the other hand, there are strong arguments in favour of keeping the present requirements and for even further attention to be paid to making airliners and their passengers more "ditch-worthy." Evidence suggests that, faced with the choice between a forced landing on rough or built-up terrain and a ditching in a river, lake or inshore water, most pilots would choose the latter. A case in point occurred last October, when a twin-jet Aeroflot Tu-124 was successfully ditched in the River Neva after complete failure of both engines over the centre of Leningrad. Full details of the Tu-124 ditching have only recently become available in the west through the publication of accounts in various Soviet newspapers and technical journals.

A total of 52 people (44 adult passengers, one child and seven crew) were on board the aircraft, which had left Tallin in Estonia at 0855hr local time on a scheduled flight to Moscow. Capt Victor Mostovoy had ordered the undercarriage to be retracted but, during this operation, a loud bang was heard; investigation showed that the nose leg was only partly retracted and that it would not lock down. Subsequent examination revealed a sheared bolt in the mechanism.

Reporting the difficulty to ATC Tallin, Capt Mostovoy was advised to proceed at low altitude to Leningrad, where emergency services were alerted. Low altitude was recommended to avoid the danger of possible decompression (from the dangling undercarriage rupturing the fuselage) and to cause the more rapid burning of the fuel load.

Leningrad was selected for the emergency landing because fog was developing at Tallin. The emergency destination area was reached at about 1100hr and height reduced to around 2,000ft while fuel was consumed as quickly as possible during low-altitude circuits in the holding area. At 1210hr the aircraft started its eighth and last circuit. According to the newspaper *Izvestia*: "The passengers had by then begun to guess that they were being diverted to Leningrad instead of Moscow because of bad weather at the latter."

During holding, the crew had arranged for all the heavy baggage to be removed into the rear of the aircraft, to put the c.g. further aft (to minimize the load on the nosewheel at touch-down), and passengers were strapped in. While about 13 miles from Leningrad airport, the port engine suddenly stopped due, it is thought, to lack of fuel although the contents gauges still showed some remaining. While the aircraft was over the city turning on to an immediate approach the starboard engine also stopped. In the few seconds remaining, since the aircraft was below 1,000ft and descending rapidly, the captain immediately ordered all crew aft, with the exception of the second pilot. At this stage the aircraft was over a heavily populated area on the east side of the city but near the River Neva, which at that point is some 1,000ft wide.

Approaching the Neva at an angle, Capt Mostovoy flew the Tu-124 diagonally over Okhtinsky Bridge, and 14sec after the second engine failure, made a "very accurate" ditching in the river, in a tail-down attitude.

The ditching impact was severe but caused no substantial damage and the aircraft remained afloat. Soon afterwards, it was taken in tow by a nearby tug, using a line secured to the control column. The tug unfortunately damaged the windscreen and water started to flow in. The aircraft was, however, towed towards the bank, and was lined with rafts of floating lumber.

Since in all the reports no reference is made to the provision of life jackets or life rafts, presumably none was carried or they would almost certainly have been launched as a precaution. In the event all the occupants stayed on board, passengers being instructed to remain in their seats, until disembarked. The aircraft was towed between two rafts of lumber and the crew were able to direct the passengers, without urgency, through the rear door.

A Significant Decision

Probably the most significant factor in the accident was that the choice of ditching was open to the captain and that he took this course with complete success. The shortness of time available for a decision together with difficult conditions of light and visibility and the possible hazards of unseen obstacles on any open spaces available must undoubtedly have influenced his choice. It is not known whether previous ditchings of the Tu-104 or Tu-124 types have been made, but their resemblance to the Comet family—known from model tests to possess good ditching capability—supports the impression that the designs have fundamentally good ditching characteristics. In this instance, however, the complete absence of engine power and the dangling nose undercarriage must have increased the difficulties of the captain.

Although the impact deceleration was said to be severe, there was no mention in any report of the seats breaking loose, and the fact that all the occupants escaped without injury supports the view that this did not occur. This also suggests that the deceleration on ditching was no more than would normally be expected in such circumstances, probably of the order of 3-4g. The pressurized fuselage undoubtedly helped to preserve the integrity of the aircraft, enabling it to remain afloat, in spite of the mishap caused by the tug.

While this particular ditching was happily concluded without loss of life, it was made possible by a number of factors upon which an operator cannot invariably rely. For example: (1) had the pilot's coolness, skill and judgment been in any degree less, the aircraft might well have sustained more severe damage on impact, causing it to sink within seconds; (2) had the incident arisen due to engine failure at take-off, with a full load of fuel, flotation time would have been substantially reduced; (3) had a rescue vessel not been close to the ditching position, rescue might well have been too late to save survivors; (4) reduced visibility could have made the ditching much more difficult.

The number of ditchings of landplanes, in which all occupants have been able to remain on board for an appreciable length of time, are few indeed and no other case is known of an aircraft being towed ashore in such circumstances, with all survivors still on board.

Construction of a vast steel cantilever hangar big enough to accommodate VC10s is now well advanced at British United's maintenance base area at London Gatwick Airport. The first bay is expected to be ready by the end of this year, and provision has been made for three additional bays. The first of BUA's two VC10s on order will soon be delivered