

The Licensing of Helicopter Maintenance Engineers

By J H SPAULL, *Air Registration Board*

I should like to commence by referring to the remarks made during the all-day discussion on Helicopter Maintenance organised by your Association in co-operation with the Society of Licensed Aircraft Engineers, which was held on 21st October, 1950. Reference was then made to the practical difficulties of drafting the requirements for helicopter licensing because of the relatively short duration of the experience which candidates would have had at that time. It was said that there was no doubt that the requirements would be amended as soon as it was possible for engineers to have had the minimum experience required by the Board. This stage was reached early last year and Section "L" of British Civil Airworthiness Requirements was re-issued on 1st April, 1952.

I will presently give you more details of the amendments in relation to the requirements for the licensing of helicopter maintenance engineers but before doing so I must explain that, in the particular field with which we are concerned, there has been relatively little alteration since Mr Norman spoke on this subject over two years ago. I refer, of course, to the operation of helicopters for the public transport of passengers or carriage of freight, because it is only for this type of operation that an engineer needs to be licensed, but other work on civil helicopters can be carried out by Organisations within the scope of their approval under the Air Navigation Acts. Although much progress may have been made in the Armed Services and in factories, we still have no helicopters operating regularly with reservations on public transport and the Board has consequently had no more than a handful of requests for licences for the certification of helicopters. Because of this the syllabus of examinations is substantially unaltered from when it was first drafted. When regular operation of civil helicopters really begins in earnest and the Board is requested to license more engineers, it is possible that some alterations will be necessary, but for the time being the present syllabus is quite adequate.

I would like now to explain in more detail how the Board amended the relevant part of Section "L" Licensing in April, 1952. One of the first reasons for amendment was that engineers who were applying for licences in respect of fixed-wing aircraft engines were at a disadvantage when compared with engineers applying for helicopter licences. For aeroplane engines the general experience requirement was two years whereas, in the helicopter case, it was only necessary for an engineer to have had one year's practical experience of the maintenance of helicopters. (Here I should mention that for licensing purposes the helicopter engine and structure have always been considered as an entity so that when we talk about helicopters we are referring to the engine as well as the structure.) To give an example of this first difficulty in an aircraft such as the S 51 helicopter having a Pratt and Whitney Wasp Junior (which is a supercharged engine) it was possible with the old requirements to obtain this on a helicopter licence with one year's experience as opposed to two years when applying for the same engine installed in an aircraft such as the Lockheed 12. This meant that the same engine could be obtained on a licence at different levels of experience.

Another anomaly arose when the question of extension was considered. An engineer with a Pratt and Whitney Wasp Junior on his licence in relation to a helicopter could apply for an extension to include this engine in relation to a fixed-wing aircraft when he had only an aggregate of experience of, say, eighteen months (made up of essentially twelve months before he obtained the S 51/Wasp Junior endorsement and a possible six months since) as compared with a minimum of twenty-four months total experience, which is the minimum maintenance experience required for any supercharged engine.

It should be remembered that the question of considering the helicopter with its rotor is somewhat equivalent to considering the fixed-wing aircraft engine with its propeller. The holder of a licence in Category 'C' for a fixed-wing aircraft of the same type which may be installed in a helicopter is not authorised to certify the engine in a helicopter because, in endorsing the licence in the latter case, the engine is related to the type of helicopter in which it is installed. Conversely, the holder of a licence valid for an engine installed in a particular helicopter is not authorised to certify an engine of the same type installed in a fixed-wing aircraft. To give one example, an engineer with a licence endorsed for the Pratt and Whitney Wasp Junior in the S 51 helicopter is not authorised to certify the Pratt and Whitney Wasp Junior when installed in a Lockheed 12 unless he has satisfied the Board as to V P propeller operation and so on. An engineer holding a licence valid in Category 'C' in respect of the Pratt and Whitney Wasp Junior, would only be authorised to certify the same engine installed in the S 51 if the Board had made an additional endorsement on the licence worded something like "Pratt and Whitney Wasp Junior when installed in either fixed-wing aircraft or S 51 helicopters."

When the general revision of the requirements for licences was made in April, 1952, the aforementioned anomalies were removed so that it is no longer any easier for the engineer who applies for a licence for helicopters as opposed to the engineer who applies for a licence for fixed-wing aircraft engines.

By April, 1952, sufficient time had passed for engineers to have had the experience which the Board desired to prescribe and the experience requirements were therefore amended accordingly. Another amendment was the removal of the limiting weight of 6,000 lb which, in the 1949 version of the requirement, had been inserted as a precautionary measure. In 1949 the Board had in mind only one type of helicopter which was being prepared for civil aviation and the requirements were written around this particular helicopter. The purpose of putting in the weight restriction was to ensure that, at that stage of general inexperience, other types were excluded. Having regard to the development of larger types of helicopters between 1949 and 1952, the requirements now prescribed will, in the opinion of the Board, meet the sort of maintenance standards for any type of helicopter in the foreseeable future. In addition to prescribing longer periods of general engineering experience the licence has been sub-divided so that it may be endorsed for helicopters incorporating unsupercharged or supercharged engines. The position now is that

- (1) Applicants for the grant of a licence for the certification of helicopters fitted with unsupercharged piston engines must have had at least three years' general engineering experience, which must include periods

totalling one year on the maintenance of helicopters (including engines) In addition, applicants must have had recent practical experience of the maintenance and inspection of the type of helicopter (including engine) for which application is made

- (11) Applicants for the grant of a licence for the certification of helicopters fitted with supercharged engines must have had three years' general engineering experience which must include periods totalling two years on the maintenance of engines before flight and, of this, at least one year must have been on the maintenance of helicopters fitted with supercharged engines including recent practical experience on the type of helicopter for which application is made Where the applicant already holds a licence in Category 'C' valid for a supercharged piston engine, the total experience required may be reduced to one year, all of which must have been spent on the maintenance of helicopters including recent practical experience on the type of helicopter for which application is made

As to the future, there are possibilities of jet-operated helicopters in which, for example, small jets may be fitted at the ends of the rotors The Board has not, at this stage, prescribed conditions for the grant of a licence to certify jet-operated helicopters although, if such a case arose, the Board would undoubtedly base its decision on its requirements for turbine engines in fixed-wing aircraft in relation to the present requirements for helicopters The current turbine engine requirements have been found quite satisfactory and would form a useful basis for whatever form of propulsion was used, so that decisions could be taken on an "ad hoc" basis

It should be noted here that in conformity with the action taken with regard to the overhaul and repair of certain larger fixed-wing aircraft (and large engines), whereby the Board has limited the extent to which licences may be issued in these Categories, similar action will be taken as far as the helicopter is concerned It is not the intention of the Board to consider licensing individuals for the overhaul and repair of helicopters and consequently there will be no 'B' or 'D' licences in respect of helicopters

In connection with the problem of licensing personnel for the certification of helicopters now in course of construction or undergoing flight trials, the Board has appointed Surveyors who, from the earliest stage, will investigate helicopters in relation to the problems which are connected with licensing, so that, by the time applications are made for such helicopters, these Surveyors will be thoroughly conversant with the types concerned This will enable the Board to continue its policy of presenting practical and worthwhile examinations

MR SHAPIRO We thank Mr Spaul for his Paper—from which I conclude that I have missed my chance of getting my ticket the easy way¹ I shall now ask Mr SHIPPEY to give us his Paper, on the standards of maintenance, with reference to requirements for the issue of Helicopter Engineers' Licences Mr Shippey joined the Fairey Aviation Co as Inspector in 1935 In 1939 he joined General Aircraft and in this firm became associated with the R-4 helicopter He obtained his "A" and "C" licence on the S 51 helicopters in 1949 after having been with the B E A Helicopter Unit for a year He is now concentrating his attention on the maintenance of the Bristol 171—still with the B E A Helicopter Unit