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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

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REGULATION OF AIR TRAFFIC 91

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By Devaluez.

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## REGULATION OF AIR TRAFFIC.\*

By Devaluez.

Considering the progress of aerial navigation, the importance of uniform laws and the necessity of establishing certain principles and regulations intended to avoid controversies, and animated with the desire of aiding the development of international aerial communications for the purposes of peace, on October 13, 1919, the signatory governments of the peace treaty established a convention regulating aerial navigation.

The high contracting parties, while recognizing the complete and exclusive sovereignty of each power over the air space above its own territory, studied all cases susceptible of creating litigation between the different governments due to international aerial navigation and established laws accordingly.

With the observation of these laws, each government contracted to accord, in time of peace, to the aircraft of the other signatory powers of the convention, the liberty of inoffensive passage over its territory.

Without awaiting the signing of the protocol of this convention, most of the countries made special agreements with the countries to which they were joined by air routes and published special rules regulating the circulation of their aircraft over their own territory.

Thus France made agreements with Great Britain, Switzerland and Holland, and a decree was signed July 8, 1920, regulating

\* From "Premier Congrès International de la Navigation Aérienne," Paris, November, 1921, Vol. I, pp. 165-170.

aerial navigation in France. This decree, together with the bill subsequently submitted to the senate, inspired the international convention and differed from the latter only in certain details.

It appears therefore that we can study concurrently the regulations for international aerial traffic established by the convention of October 13, 1919, and the French regulations established by the decree of July 8, 1920. These two sets of regulations supplement each other, the second being the practical application of the principles contained in the first.

The principal questions covered by the present legislation are as follows:

1. Conditions of safety which must be fulfilled by aircraft;
2. Licenses for members of the crew;
3. Traffic rules to be observed by French and foreign aircraft.

To these regulations there must be added those connected with the customs laws and the measures adopted by each country for its national defense.

Such are the broad lines of aerial regulation, which will be briefly expounded in the present article, some of these questions moreover needing to be the subjects of special communications.

#### Safety Requirements of Aircraft.

Both international and French legislation require that no aircraft shall be operated without a certificate of navigability.

This certificate, as defined by the French decree, is the attestation of the safety characteristics of the aircraft.

For the purpose of requiring guaranties as regards the safety characteristics of an airplane used for commercial purposes or for air travel, the French regulations impose a series of tests for new aircraft types and supervision of quantity production of aircraft.

The following procedure has been adopted and seems capable of giving all the necessary guaranties. The builder of a new type of aircraft must present his machine to the Technical Section of Aeronautics, which will subject it to static and flight tests. These tests will show whether the aircraft has a large enough factor of safety and whether its characteristics and performances fulfill the requirements of the use for which it is designed.

After the tests have been made on the sample aircraft, its quantity production is supervised by the Section of Aeronautic Construction, which makes sure that the aircraft thus produced is an exact copy of the sample, both in its characteristics and in the nature of the materials employed in its construction. In quantity production, any aircraft that has undergone modifications susceptible of affecting its characteristics and performances, must be subjected to the same tests as the original sample.

After the tests of a new type have been completed and adjudged satisfactory, its construction being under the control of com-

petent parties, the aircraft may receive its certificate of navigability and, as soon as it is employed, it comes under the control of the Aerial Navigation Section.

This section determines, at longer or shorter intervals, according to the use made of the aircraft, whether it continues to meet the safety requirements for holding the certificate of navigability. According to circumstances, the certificate is continued if the aircraft is in proper condition, or suspended if it is temporarily unavailable on account of undergoing repairs, or permanently withdrawn, if it is unfit for further use.

An aircraft, on receiving its certificate of navigability, also receives its books, consisting of a route book, an aircraft book and an engine book. These books, which must be kept strictly up to date, render it possible to control the use of the aircraft, to comment on the routes followed and to keep track of incidents of navigation, accidents and repairs made.

#### Licenses.

In order to take his place as an authorized member of the crew of a public aircraft for transportation or touring, any person performing the functions of pilot, navigator or mechanic, must have a license or certificate. These certificates, which attest his physical and technical qualifications, comprise:

1. License as touring pilot, which does not confer the right to serve on a public aircraft, no matter in what manner he may be remunerated.

2. License as public transportation pilot, which gives him the right to carry passengers or freight for pay.

In each of these two classes (touring and public transportation) there is a special license for pilots of naval airplanes and seaplanes, by reason of special qualifications considered desirable for piloting such aircraft.

3. License as pilot of free balloon.

4. Three licenses (1st, 2nd and 3rd class) as airship pilot. The holder of a license of the 1st class can command all kinds of airships. The holder of a 2nd class license may command airships of less than 20,000 cubic meters gas capacity. A holder of a 3rd class license may command airships of less than 6,000 cubic meters.

5. There are two aerial navigator licenses, elementary and superior. The presence of an elementary navigator is required by day on every public transportation aircraft making a trip of more than 200 and less than 500 km over land, or a trip of less than 200 km over water and such that the course, supposedly straight, does not carry the airship over 50 km from the coast. By night, the presence of an elementary navigator is required for every trip of less than 100 km, without leaving the country.

The presence of a navigator holding a superior license is required on any public transportation aircraft making voyages, by day or night, above land or water for distances greater than those mentioned above.

6. Only one form of license for mechanics employed on public transportation aircraft.

Candidates for the various licenses must undergo practical tests and pass technical examinations in accordance with a methodical plan and corresponding to the requirements of the aerial tasks which they propose to perform. Military pilots who have kept in practice may be excused from the flight tests.

With the exception of the license of touring pilot, licenses are only granted candidates, after satisfactorily passing a medical examination before a special board of physicians.

All licenses must be renewed every six months. In order to have his license renewed, the holder must submit to another medical examination. If he is an airplane pilot, he must show by the record of his aerial services during the previous six months, that he has lost none of the professional qualities required for the issuance of his license.

The interval of time, during which the holder of a license must not have interrupted his aerial services, is six months for airplane pilots, two years for airship pilots and five years for navigators.

### Traffic Rules for Aircraft.

#### Registration.

We have just seen that an aircraft cannot be certified for flying, without answering certain rigid requirements and that similar precautions are taken with regard to the crew.

To these fundamental conditions, which are mostly for increasing the safety of aviation, there have just been added rules for preventing collisions in flight, especially over and in the vicinity of airdromes.

The limits of this article do not allow us to explain in detail the measures adopted for this purpose. We will mention however that these very complete regulations anticipate the maneuvers to be made by aircraft crossing or passing one another and landing or taking off simultaneously. They also provide for flight in the vicinity of and above airdromes: the direction aircraft must turn in response to signals and according to an established code; the interdiction of all acrobatic maneuvers and the division of the airdromes into landing and departing zones and a neutral zone.

These rules also prohibit flight over cities and towns, save at altitudes from which an aircraft can land outside the town, in case of failure of its means of propulsion.

For the purpose of being able to control the circulation of aircraft and identify them in case of infractions of traffic regulations, registration rules have been established. Every aircraft must be recorded in a special register and receive a registration certificate, on which are mentioned the distinguishing marks assigned to it, together with the name and address of its owner.

The registration marks, which consist of a letter indicating the nationality and a group of four letters, must be painted on the aircraft at designated locations and large enough to be ordinarily easily read by an observer on the ground.



### Customs Regulations.

In order to conform to customs laws, the following regulations have been adopted. Aircraft leaving the country can only depart from airdromes specially designated by the Customs Department of each country. Those coming from other countries must land on the same airdromes. Moreover, all aircraft flying from one country into another must cross the frontier between certain designated points.

The observation of these conditions enables the accomplishment of the customs formalities and the surveillance of the points of passage. Customs formalities on the designated airdromes comprise the verification of the freight, endorsement of manifest and route book and collection of customs duties.

Chance landings outside customs airdromes are provided for. If the commander of an aircraft, leaving a customs airdrome for a foreign country, lands before reaching the airdrome where he should accomplish the customs formalities, he must have his cargo verified by the nearest representatives of the Customs Department. He may depart again only by authorization of this department which, after verifying his books, designates the airdrome where the next landing is to be made for the purpose of paying the customs duties.

### Safeguarding the National Defense.

By the terms of the international convention, the contracting countries having reserved the right to prohibit, for military

reasons, flight over certain portions of their territory, each country has published special regulations on this subject.

France, who, by the decree of July 8, 1930, had anticipated the prohibition of flight over certain portions of her territory which she reserved the right to designate later, abrogated these dispositions by the decree of June 10, 1931.

Private French aircraft and the aircraft of countries with which France has made agreements are therefore authorized to fly over all parts of the country, on condition that they observe the air traffic regulations given above.

Flight over certain zones is, however, forbidden all aircraft carrying photograph or kinetograph cameras.\* Special authorization may be accorded French citizens to use photograph cameras over the forbidden zones, but this privilege cannot be extended to foreigners.

Outside the prohibited zones, any French subject may use photograph cameras without special permission. The same privilege may be accorded foreigners, but only after a request has been addressed, by the parties interested, to the "Service de la Navigation Aerienne" (Department of Aerial Navigation), and after inquiry of the department concerned (Department of the Interior or

\* a) The part of France east of a line passing through the valley of the Meuse; the valley of the Moselle and the upper course of the Doubs as far as Switzerland.

b) The six military ports of Cherbourg, Brest, Lorient, Rochefort, Toulon and Bizerte, as also Dunkerque, Nice, Villefranche and Bonifacio.

of Foreign Affairs), according to whether the foreigner resides in France or not. Permits for the use of photograph cameras by strangers are temporary and their validity cannot exceed one month.

The above brief exposition of aerial regulations now in force does not pretend to be exhaustive, but only a summary of legislation which is entirely new and of recent application.

This legislation, in harmony with the present resources and needs of aerial navigation, cannot be considered final and must be modified in the future according to conditions.

It may be affirmed that safety must depend on the strict application of such regulations and without safety there can be no great development of aerial navigation.

Translated by the National Advisory Committee for Aeronautics.