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SAFETY IN AIRLINE OPERATIONS FROM THE VIEWPOINT OF THE CHIEF PILOT*

HARLAN HULL‡

It goes without saying that "SAFETY" is the prime factor in Airline operation. SAFETY IN OPERATION is the watchword of every member of the Operations Department of the Airline, from the Head of the Operations Department down to the most Junior mechanic's helper or ship cleaner.

Named in order, the three major aims of the operations personnel are (1) Safety, (2) Efficiency of Aircraft, (3) Maintenance of "on schedule" performance.

It is, of course, obvious that these three factors must always remain uppermost in the minds of operations personnel if the business is to succeed. We will never reach the ultimate in safety and efficiency since the constant thought and effort being given to these factors are always bringing new elements to the front for improvement. However, I am happy to say that the developments in Aircraft and Operations Methods during the past few years, along with the promise of new developments which are under way, show that we are approaching the ultimate in safety even though it may never be reached. Even now, a passenger may purchase passage on a modern Air Liner with the assurance that he will travel in safety comparable to that of any other modern mode of transportation.

The "FLYING PERSONNEL" of an Air Line are naturally directly concerned in the maintenance of the Aircraft which they fly since their skill and knowledge could not offset the deficiencies which would result from poor maintenance. It might be well to point out at this time that the proper maintenance of the Airlines' Aircraft is the first step in attaining safety. The Maintenance Department is the most important division in the Operations Department since this Department is directly responsible for the proper maintenance of all flying equipment. Another important function of the Maintenance Department is the development of new mechanical features which will add to the safety of flight operation.

The pilot enters the picture insofar as the Maintenance De-

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partment is concerned when that department receives his written report of the mechanical condition of the plane at the end of each flight. The pilot makes out his report during the flight and it consists of a complete log of all engine and operating data. He lists the amount of Horsepower used, the operating temperatures and pressure of oil, fuel consumption, fuel air ratio of mixture, etc. The log lists the Pilot's report of the mechanical condition of the airplane, engines, instruments, radio and other mechanical accessories. The pilot is very careful to see that his report is complete and fully covers the mechanical condition of the plane since he knows that this report will be a guide to the mechanics in preparing the plane for the next flight, and any incorrect mechanical conditions listed in the pilot's report receives immediate attention.

The Chief Pilot's Office is the clearing house for dissemination and handling with the Maintenance Department, the various recommendations pilots have for improvements in flying equipment. Pilots present many ideas which are of great value to flight safety and putting these ideas into practical operation, which requires a thorough analysis of their value along with a period of testing, is, in itself, an interesting occupation.

Along with assisting the Maintenance Department in test work, the Chief Pilot's major job is to see that the skill and technique of the Captains and First Officers comes up to the highest standards possible in the profession. Air Transport is no safer than its pilots. The first step is to have the best flying equipment possible and then man this equipment with the most skilled pilots possible to obtain, plus constant intensive training. This combination, backed up by an excellent Maintenance force and Dispatching System for flight control results in a safe operation.

In the earlier days of air mail operation, a pilot was more or less on his own once the flight started, and this type of flying developed a very resourceful type of pilot who became the backbone of our flying organization of today. The development in aircraft design required a like development in flying methods. The pilot of fifteen years ago would be totally at a loss if he climbed into the cockpit of a modern Air Liner of today. The fundamentals of flying have remained the same, however, the development of these fundamentals has been as remarkable as the development of Air Transport itself.

A Pilot's education never ceases if he is to keep pace with the development of operation methods made possible by the work of the aeronautical engineers. The increased cruising speeds and

cruising range of the modern Air Liner are two important developments for safety insofar as the pilot is concerned. The faster speed and increased range enable the detouring or rapid passage over, of nearly any storm area.

In the early days of air transport, it was a serious matter to lose sight of the ground, and many accidents were incurred in attempting to maintain visual contact with the ground during periods of bad weather. Now, the well trained pilot, flying a modern Air Liner thinks no more of flying from destination to destination without looking outside of the cockpit and any further than the instruments on the panel in front of him than he thinks of driving his automobile from the airport to his home. Being able to accomplish this permits the flight to be carried out at a level which will safely clear all obstructions along the route at a safe margin regardless of weather conditions.

This is accomplished by what is known as instrument flying—sometimes called “blind” flying in the parlance of the layman, which it most *certainly is not*, since the pilot is far from blind. He knows his exact position along the route, and the attitude of his plane in space equally as well as though he were flying along in the sunshine. I believe I would call Instrument Flying the greatest single contribution to flying safety since the inception of flying itself.

No one realizes this more clearly than the pilots who flew the air mail in the early days before this type of flying was possible. They now fly these same routes in conditions of far worse weather, safely, as a matter of simple routine. This has not all come about as a matter of simple evolution. Instead, it has been brought about by many years of hard work and experimentation by engineers and pilots who had the courage and ambition to carry out their convictions. This experimentation and development was made possible by a group, who I believe, seldom are thought of in the development of the Aviation industry—without the people who have had the courage and faith to put up the money necessary to start the airlines and maintain them through this pioneering stage, the progress that has been made in so brief a time would have been impossible.

Since we consider the qualifications of our pilots so important to safety, it may be of interest to you to know something about them. Ninety per cent of our pilots come from the Military services; the Army, Navy and the United States Marine Corps. The other ten per cent come from sources of commercial training. The reason why the greater percentage comes from Military sources is that we keep our requirements in education and type of Flight

Training very high, and it is very difficult to obtain as thorough and complete a flight training commercially as is given by the Army and Navy Flight Schools. Therefore, there are very few commercially trained pilots in proportion to Military trained pilots who meet our requirements. This does not mean that commercially trained pilots do not develop into Airline Transport pilots equally as good as the product of the Military schools. It merely means that the average lad does not have the opportunity in the commercial schools that is made possible in the Military Schools.

Some of the greatest transport pilots have come up through the ranks of the barnstormers and have never seen the inside of the cockpit of a military airplane.

These lads all start out with good educational backgrounds, most of them have college degrees, and very few have less than two years of college training. Quite a few of them are graduate Aeronautical Engineers and many others have degrees in other branches of engineering.

The Air Lines are consistently expanding and it becomes important, not only to maintain a highly trained corps of active First Pilots—Captains as we now term them—with the attendant reserve body of Second Pilots—or First Officers—some of whom, having passed successfully through the primary and secondary stages of training, are ready for promotion to Captain when the need arises; but it is also imperative that fresh material be kept coming in at the bottom to fill the vacancies caused by promotion at the top.

We receive countless applications for employment as First Officer; some are solicited, many are voluntary and some are produced upon recommendations from various members of the active pilot ranks. Out of this file, those who meet the minimum requirements for employment are retained for consideration by a Pilots Selection Board.

A brief resume of the career of an applicant from the time he is accepted for employment until he becomes a regular line captain is as follows:

We have previously looked up his background, record and qualifications, and studied the required letters of recommendation from qualified sponsors. These may be military or civil authorities or mutual friends of long standing. All this information is put before the Selection Board. Often some member of the board has served with the applicant in the Service, or has otherwise flown with him. If there is, for example, a need for 10 new men, the 10 best fitted ones are selected by the Board from perhaps a hundred

qualified applicants. There must be no apparent question in the minds of the Board as to the chosen ones being exceptionally suited for the job. The remainder of qualified applicants are given a semi-official "OK" or rejection and placed in the Reserve File, or rejected file, as the case may be. This affords a primary consideration for the next Selection Board.

The Applicant is brought to the Operations Base for a two weeks ground school course administered by Instructors chosen from the ranks of the active First Officers. The student is drilled in the TWA Operations Manual, Radio Operation, Department of Commerce Regulations, Navigation, Flight Planning, Meteorology, First Officer duties, and a thorough grounding in operation of the flying equipment and ground aids used by the Company. This instruction period is purely a familiarization class—his education is merely begun. He must, however, pass a series of written examinations before being assigned to flying status. Failing to pass these examinations is sufficient cause for elimination at this point. Once successful, however, he is properly uniformed and placed on flight status for a probationary period of three months.

The student now has a general idea of what is expected of him in preparation for flight and in the cockpit. Before he is assigned to flight duty, he must first make several "student" round trips over the line merely as an observer, absorbing all he can of actual Flight operations by observing the experienced crew in scheduled flight operation.

The next step is assignment as First Officer on regular runs with Senior Captains. At the end of his three months probation period he must come up before *another* Selection Board for final approval as suitable Pilot material. At this time, each Captain who has flown with the man in question must submit a Fitness Report for the information of the Board. This Fitness Report outlines in detail the degree of aptitude he shows in all Departments of Flying and First Officer duties. If he passes this board he is placed on Permanent Flight Status as First Officer.

It must be remembered that the aspirant is, in the very beginning an accomplished pilot, otherwise he would not have achieved his Military status—or, if commercially trained, he would not have the record he has behind him. Therefore, this first period of selection and training is more of a "super selection"—an exacting investigation of his aptitude and attitude toward the particular requirements of Airline Flying.

Upon being approved by the Board as suitable for permanent

status, the young First Officer now starts his training in earnest. For the next year he is very busy studying such important phases of his flying as Navigation, Flight Planning, Radio and Meteorology. TWA maintains Navigation, Meteorological, Radio Engineering and Communications Departments *second to none*. The Department Heads of these sections provide courses and instructors who carry on continually a training program for Captains and First Officers. All Flight Personnel are required to keep up to date, and on passing status in these courses; every new development in flying or airline operation is carefully formed into an instruction or information course for the use of the Flying Staff. The young First Officer, as well as the other First Officers and Captains are, through the medium of Operations Meetings and Instruction Circulars, kept up to the minute on maintenance and operation of the ships used by the line. No item of Department of Commerce Regulations or development of Airway aids escapes forceful impression on flight personnel by "Instruction Letter" from the Vice-President in Charge of Operations. Flying Technique and various important items pertaining to Pilot procedure and operation are the subjects of a current course of General Information Letters distributed frequently to Flight Personnel. A file of these letters and circulars would produce an interesting history of Modern Airline Flying.

In the cockpit, the Captain takes pains to train his Assistant, the First Officer. He is taught the particular characteristics of the type of ship he is flying, care of engines, landings, takeoffs, etc. He is made to fly "under the hood" in good weather and finally allowed to fly the ship on instruments under actual conditions. He becomes adept in operating special equipment such as De-Icing apparatus, the Loop Direction Finding Antenna, Compasses, etc. He is continually trained in dead reckoning by use of the Flight Log, which is kept up to the one-half minute all the time.

At the beginning of his duty on Permanent status, the Junior First Officer is required to obtain his Scheduled Air Transport Rating. Instrument Flying equipment is provided for the necessary training to accomplish this license.

After two to three years training as First Officer, the now Senior First Officer is seasoned and ready for consideration for promotion to Junior Captain. A *Pilot Selection* Board again meets to pass on this step. If successful, he is placed on the reserve list for promotion to Junior Captain when the need arises.

For final promotion to Captain status—he makes several regular trips as Captain, under the supervision of a Chief Pilot in charge of the flight. He is also put through many tests with a ship loaded only with ballast, such as one engine operation, approaches and landings with one engine off, cross wind landings and takeoffs, instrument takeoffs, recoveries from unusual maneuvers and all manner of instrument flying. After successfully passing the final check for promotion to Captaincy, he is assigned first to what is termed a "TRAINING RUN"—usually daylight flights over flat terrain.

Six months to a year on this run, and the Junior Captain, now thoroughly seasoned, is well on the way to becoming a seasoned Line Captain.

It may seem paradoxical to say it, but it is true, that now his education has really begun, for no one will gainsay the statement that in flying, one never ceases to learn, and the most Senior Captain is studying just as hard on new and advanced phases of Airline Flying and its essential counterparts, as the most Junior First Officer.

You may be sure that once the First Officer is checked out as Captain, he is a qualified, safe and efficient pilot.

The Company and the Pilots know, that the way to avoid accidents is to have a safe and qualified Captain in the pilot's seat, and that is what TWA is doing.