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CIVIL AERONAUTICS MANUAL 61

U. S. Department of Commerce — Civil Aeronautics Administration

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Supplement No. 11 — January 10, 1952

SUBJECT: 61.101
Airmen Utilization

61.112
Instrument Competency

The Office of Aviation Safety announces the attached interpretations of CAR 61.101 and the attached policies and rules applicable to CAR 61.112.

61.101-1 FLIGHT CREW MEMBER

61.101-2 FAILURE TO COMPLETE INSTRUMENT COMPETENCY CHECK

61.112-1 GENERAL STANDARDS

61.112-2 PURPOSE OF OBSERVING PERFORMANCE

61.112-3 AIRCRAFT USED IN FLIGHT CHECK

61.112-4 FLIGHT SIMULATOR

61.112-5 PROFICIENCY REQUIREMENTS

Attached hereto are new pages headed "CAR 61.101 Airmen utilization" and "CAR 61.112 Instrument competency." The attachments should be retained as pages in the series of statements issued in explanation or implementation of Civil Air Regulation 61.

CAM 61.101-1 "Flight crew member" appeared in the Federal Register of July 16, 1949, and the other interpretations, policies and rules were published in the Federal Register of January 5, 1952.

E. S. Hensley
Director, Office of
Aviation Safety

Attachments

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22c, 22C-1

61.101 AIRMEN UTILIZATION. No scheduled air carrier shall utilize any dispatcher or flight crew member in scheduled air transportation until such airman has met the appropriate qualifications and requirements prescribed by the regulations of this subchapter.

61.101-1 *"Flight crew member" (CAA interpretations which apply to 61.101).* A "flight crew member" is defined as "a pilot, flight radio operator, flight engineer, or flight navigator assigned to duty on the aircraft" [41.137 (i)].

61.101-2 *Failure to complete instrument competency check (CAA interpretations which apply to 61.101).* A scheduled air carrier must not utilize as a pilot in command in scheduled air transportation any pilot who has failed to satisfactorily perform any of the requirements of the six-month instrument competency check set forth in CAM 61.112-5.

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61.112 INSTRUMENT COMPETENCY. The pilot in command, in addition to meeting the minimum requirements for an instrument rating provided for in 20.42 of this subchapter, and appropriate provisions of Part 21 of this subchapter, as the case may be, must prove satisfactorily to the operator's check pilot, within forty-five days prior to the end of every six-month period after entry into the service in accordance with the training program required by 61.131 to 61.135, his ability to pilot and navigate by instruments an aircraft of a type to be flown by him in the air carrier service. Additional checks may be required by the Administrator at his discretion.

61.112-1 *General standards (CAA policies which apply to 61.112).* CAM 61.112-5 establishes the minimum requirements for the air carriers in establishing the instrument competency of a pilot in command. The air carrier may perform these requirements in any order or arrangement that will achieve complete coverage of the competency check in a minimum amount of flight time. Where first performance may be unsatisfactory, additional training thereon may be given during the check or later, and the unsatisfactory item rechecked during the check or later for satisfactory performance. The extent of this additional training shall depend on the applicant's satisfactory flight proficiency demonstrated in other phases of the check which, in the opinion of the check pilot, would warrant such additional training. In addition, the air carrier should where a particular type or condition of operation prevails, add to the requirements listed in 61.112-5.

61.112-2 *Purpose of observing performance (CAA policies which apply to 61.112).* When an agent of the Administrator is observing the performance of a six-month proficiency flight, his primary objectives will be: (a) an evaluation of the air carrier's pilot flight proficiency training program, and (b) a determination as to whether the air carrier's check pilot is requiring demonstrated performance by the pilot in command as set forth in 61.112-5 and the air carrier's pilot flight proficiency training program. Any problem pertaining to the performance of the pilot in command during the six-month proficiency flight should be discussed only between the air carrier's check pilot and the agent of the Administrator. In the event that there is a difference of opinion between the air carrier's check pilot and the agent as to methods of performing the required maneuvers, such differences of opinion should be resolved between the agent and the air carrier and should not be discussed on the flight deck during the six-month proficiency flight.

61.112-3 *Aircraft used in flight check (CAA policies which apply to 61.112).* Where a pilot in command is scheduled to fly only one type of land aircraft or one type of seaplane, he should be given his six-month competency check in that type of aircraft he is scheduled to fly.

Where a pilot in command is scheduled to fly more than one type of land aircraft and/or seaplane, his instrument competency should be checked in all types of aircraft he is scheduled to fly. However, the following exceptions will be allowed:

(a) If a pilot is scheduled to fly two-engine, three-engine, and four-engine land aircraft or any combination thereof, and/or more than one type of such aircraft, he should take his six-month competency check in one of the larger and more complicated type of aircraft; or if only one of the smaller type aircraft is available, he should take his competency check immediately due in that aircraft but his next six-month check should be accomplished in one of the larger and more complicated type of aircraft.

(b) If a pilot is scheduled to fly two-engine, three-engine, and four-engine seaplanes or any combination thereof, and/or more than one make or model of such seaplanes, he should take his six-month competency check in one of the larger and more complicated type of seaplane; or if only one of the smaller type of seaplane is available, he should take his six-month competency check immediately due in that seaplane but his next six-month check should be made in one of the larger and more complicated type of seaplane.

(c) If a pilot is scheduled to fly both land aircraft and seaplanes, his six-month competency check should include a demonstration of competency in both land aircraft and seaplane in accordance with paragraph (a) and paragraph (b).

61.112-4 *Flight simulator (CAA policies which apply to 61.112).* An air carrier using a flight simulator in its pilot's training program may be approved to utilize such a device for certain maneuvers in conducting six-month instrument competency checks provided that (a) the training device accurately simulates the flight characteristics and the performance of the applicable aircraft through all ranges of normal and emergency operation, (b) the maneuvers to be conducted in the simulator other than those specifically authorized in 61.112-5, sub-sections (l), (m), (n), (o), (p), and (q), are submitted to the Washington Office for approval by the region in which the headquarters of the air carrier is located, and (c) certain critical maneuvers which demonstrate the instrument proficiency of a pilot are executed in an aircraft of the type flown by the pilot in air carrier service. The proficiency flight in the aircraft should include at least maneuvers (minimum speed), approach procedures, handling under regular approach conditions, and take-off and landings, with engine failures as outlined in 61.112-5, sub-paragraphs (g), (q), (u), and (v), respectively.

61.112-5 *Proficiency requirements (CAA rules which apply to 61.112).* The following proficiency tests are required by the Administrator to determine the instrument competency of the pilot in command:

(a) *Equipment examination (oral or written).* The equipment examination shall be pertinent to the type of aircraft to be flown by the pilot in command and may be given (1) in the air carrier's ground school, (2) during a routine line check under the supervision of an authorized company check pilot, or (3) during the six-month competency check.

The examination shall at least contain questions relative to engine power settings, airplane placard speeds, critical engine failure speeds, control systems, fuel and lubrication systems, propeller and supercharger operations, hydraulic systems, electric systems, anti-icing, heating and ventilating, and pressurization system (if pressurized). A record shall be

maintained in the pilot's file which will indicate the date, condition under which equipment examination was given, and grade received.

(b) *Taxiing, sailing, or docking.* Attention shall be directed to the manner in which the pilot in command conducts taxiing, sailing, or docking with reference to the taxi instruction as issued by airport traffic control or other traffic control agency, and taxi instruction which may be published in the air carrier's operations manual, and general regard for the safety of the air carrier's and other equipment which may be affected by taxiing, sailing, or docking operation.

(c) *Run-up.* Attention to detail in the use of cockpit check list and cockpit procedure shall be observed on all six-month proficiency flights.

(d) *Take-off.* For those air carriers authorized take-off minimums of 200-1/2, the pilot being examined shall whenever practicable execute a take-off solely by reference to instruments, or at the option of the check pilot, a contact take-off may be made following which instrument conditions shall be simulated at or before reaching 100 feet with the subsequent climb conducted solely by reference to instruments. The check pilot shall observe the pilot's ability to maintain a constant heading during the take-off run, his proficiency in handling power, flap and gear operation during the critical period between take-off (off ground) and reaching five hundred feet. Should it become necessary for the check pilot to give assistance after becoming airborne, the maneuver shall be considered as unsatisfactory.

(e) *Climbs and climbing turns.* Climbs and climbing turns shall be performed in accordance with the airspeeds and power settings as prescribed by the air carrier or those set forth in the "Airplane Flight Mannual." The use of proper climb speeds and designated rates of climb shall be considered in determining the satisfactory performance of this phase of the proficiency flight.

(f) *Steep turns.* Steep turns shall consist of at least forty-five degrees of bank. The turns shall be at least 180° of duration, but need not be more than 360°. Smooth control application, and ability to maneuver aircraft within prescribed limits, shall be the primary basis for judging performance. When information is available on the relation of increase of stall speeds vs. increase in angle of bank, such information shall be reviewed and discussed. As a guide, the tolerances of 100 feet plus or minus a given altitude shall be considered as acceptable deviation in the performance of steep turns. Consideration may be given to factors other than pilot proficiency which might make compliance with the above tolerances impractical.

(g) *Maneuvers (minimum speeds).* Maneuvers at minimum speed shall be accomplished while using the prescribed flap settings as set forth in the Airplane Flight Manual. In addition, attention shall be directed to airplane performance as related to use of flaps vs. clean configuration while operating at minimum speeds. Attention shall be directed towards the pilot's ability to recognize and hold minimum controllable airspeed, to maintain altitude and heading, and to avoid unintentional approaches to stalls.

(h) *Approach to stalls.* Approach to stalls shall be demonstrated from straight flight and turns, with and without power. An approach to stall shall be executed in landing or approach configuration. The extent to which the approach to stall will be carried and the method of recovery utilized shall be dictated by (1) the type of aircraft being flown, (2) its reaction to stall conditions, and (3) the limitation established by the air carrier. Performance shall be judged on ability to recognize the approaching stall, prompt action in initiating recovery, and prompt execution of proper recovery procedure for the particular make and model of aircraft involved.

(i) *Propeller feathering.* Propeller feathering shall be performed. Such propeller feathering shall be accomplished in accordance with instructions set forth by the air carrier and be exercised at sufficient altitude to insure adequate safety for the performance of the operation. The pilot's ability to maintain altitude, directional control, and satisfactory airspeed shall be the desired prerequisites in accomplishing this maneuver. The manner in which the pilot manages his cockpit during propeller feathering shall also be noted.

(j) *Maneuvers (one or more engines out).* When performing maneuvers (one or more engines out) the aircraft shall be maneuvered with a loss of fifty per cent of its power units, such loss to be concentrated on one side of the aircraft. The loss of these power units may be simulated either by retarding throttles or by following approved feathering procedures. The pilot in command shall be required to maintain headings and altitude and to make moderate turns both toward and away from the dead engine or engines. Proficiency shall be judged on the basis of the pilot's ability to maintain engine-out airspeed, heading and altitude; to trim the airplane; and to adjust necessary power settings.

(k) *Rapid descent and pull-out.* This maneuver shall consist of the following steps: While the aircraft is under the normal approach configuration and being flown at a predetermined altitude, it will be assumed that the aircraft has arrived at a navigational fix and is cleared to descend immediately to a lower altitude. (The lower altitude shall be one which permits a descent of at least 1,000 feet.) Upon reaching the lower altitude, the aircraft shall be recovered from the rapid descent and flown on a predetermined heading and altitude for a predetermined period of time. At the end of the time interval, an emergency pull-out shall be executed which will involve a change of direction of at least 180°. Performance shall be judged on the basis of ability to establish a rapid descent at constant airspeed, stopping the descent at the minimum altitude specified without going below it, holding heading and altitude, and smooth pull-up and climb.

(l) *Ability to tune radio.*[1]
(m) *Orientation.*[1]
(n) *Beam bracketing.*[1]
(o) *Cone identification.*[1]
(p) *Loop orientation.*[1]

[1]NOTE: Subsections (l), (m), (n), (o), and (p) shall be accomplished in a satisfactory manner either during (1) a routine line check under the supervision of an authorized company check pilot, (2) in a simulated or synthetic trainer, or (3) during the six-month proficiency flight. A record shall be maintained in the pilot's file which shall indicate the date, method utilized, and grade received in the performance of these items.

(q) *Approach procedures.* An approach procedure shall be made in the aircraft on the let-down aid for which the lowest minimums on a system-wide basis are authorized and include, where possible, holding patterns and air traffic control instructions which might be used by the pilot in day-to-day operations. If at the time of six-month proficiency flight the let-down aid affording the lowest minimums is not in operation at the point the check is given, the landing aid which affords the next lowest minimums on a system-wide basis shall be used. Where a particular air carrier is authorized landing minimums based on instrument landing systems and ground control approach, the predominate landing aid on a system-wide basis shall be utilized. In some cases a particular air carrier may be authorized its lowest landing minimums on a let-down aid which is not installed and operating at locations where the air carrier's pilots are based. It shall be the responsibility of the air carrier in this case to conduct six-month proficiency flights at locations where such an aid is installed and operating. All other approaches for which a particular operator may be authorized to use, such as, ADF, LF/MR range, VOR, and VAR shall be made and may be conducted in a simulator or other approved type trainer. A record shall be maintained in the pilot's file which will indicate the date that these approaches were performed and the grade received. If these approaches (ADF, LF/MR range, VOR, and VAR) are not performed in a simulator or other approved type trainer, they shall be accomplished on the six-month proficiency flight.

(r) *Missed approach procedures.* [See subsection (s)].

(s) *Traffic control procedures.* Missed approach procedures and traffic control procedures shall be accomplished in a manner satisfactory to the authorized check pilot. The degree of satisfactory or unsatisfactory performance shall be predicated on the pilot's ability to (1) maneuver the aircraft while performing these procedures, (2) follow instructions either verbal or written which may be pertinent to the accomplishment of these procedures. Subsections (r) and (s) may be accomplished while performing subsection (q).

(t) *Cross-wind landing.* A cross-wind landing shall be performed when practicable. Traffic conditions and wind velocities will dictate as to whether a cross-wind landing is practicable. Performance shall be judged on the technique used in correcting for drift on final approach, judgment in the use of flaps, and directional control during roll-out.

(u) *Landing under regular approach conditions.* Landing under regular approach conditions shall necessitate a path of flight around the landing area which will require not more than a 180° turn but not less than a 90° turn. The pilot shall be judged on the basis of altitude and airspeed control and his ability to maneuver under the minimum ceiling and visibility conditions prescribed.

(v) *Take-offs and landings [with engine(s) failures].* If it is consistent with safety, traffic patterns, local rules and laws, a simulated engine failure shall be experienced during take-off. The simulated failure shall occur at any time after the aircraft has passed the V_1 speed pertinent to the particular take-off and when practicable before reaching 300 feet. When performing the landing, the aircraft shall be maneuvered to a landing

while utilizing 50 per cent of the available power units. The simulated loss of power shall be concentrated on one side of the aircraft. The pilot's ability to satisfactorily perform this maneuver shall be evaluated in the manner stated under subsection (i).

(w) *Judgment.* The pilot shall demonstrate judgment commensurate with experience required of a pilot in command of air carrier aircraft.

(x) *Emergency procedures.* The emergency procedures shall be applicable to the type of aircraft being flown and in accordance with the emergency procedures prescribed by the air carrier.

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