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**PART 40—SCHEDULED INTERSTATE
AIR CARRIER CERTIFICATION AND
OPERATION RULES**

**PART 41—CERTIFICATION AND OP-
ERATION RULES FOR SCHEDULED
AIR CARRIER OPERATIONS OUT-
SIDE THE CONTINENTAL LIMITS
OF THE UNITED STATES**

**PART 42—IRREGULAR AIR CARRIER
AND OFF-ROUTE RULES**

**Special Civil Air Regulation; Airborne
Weather Radar Equipment Require-
ments for Airplanes Carrying Pas-
sengers**

In a notice of rule making published in the FEDERAL REGISTER (24 F.R. 5847) and circulated as Draft Release No. 59-10, dated July 15, 1959, the Federal Aviation Agency proposed to amend Parts 40, 41, and 42 of the Civil Air Regulations to require airborne weather radar to be installed on all aircraft certificated under the transport category rules and carrying passengers. Operationally, it was proposed to require that such radar equipment be in operation for all IFR flights, and for night VFR flights when thunderstorms or severe weather conditions were forecast for the flight plan route during the time of flight.

In commenting upon the draft release, the Air Line Pilots Association was strongly in favor of the proposal and recommended its extension to all large aircraft engaged in air transportation.

Comments from representatives of the scheduled trunkline carriers recognized the desirability of having airborne weather radar on aircraft but opposed the mandatory requirement of such equipment by regulation.

Comments from local service air carriers, or their representatives, were generally opposed to any requirement for radar equipment on airplanes certificated

in the nontransport category or for airplanes such as the DC-4 or C-46 certificated in the transport category, which are the type of airplanes being used by such air carriers.

As stated in the draft release, a recent survey of air carrier aircraft accidents for the calendar years 1950 through 1958 has indicated the importance of airborne weather radar as a safety measure in preventing aircraft accidents during certain severe weather conditions. The value of airborne weather radar as an aid to the safety of flight is further supported by the fact that a considerable number of air carrier airplanes are presently equipped with such radar and provisions have been made for the installation of such equipment on practically all new transport-type airplanes. It is considered particularly significant that at least one large air carrier presently has its entire fleet of airplanes fully equipped with airborne weather radar and during a two-year period has not experienced a single passenger or crew injury or any appreciable airplane damage due to thunderstorms or hail. Moreover, the air carrier has completed a high percentage of scheduled trips. As experience has indicated, radar equipment contributes to greater safety in passenger operations, since it facilitates the early detection and location by the pilot of certain areas of severe turbulence and enables him to avoid such areas or to take such other action as may be necessary in the interest of safety.

In view of the foregoing, the Administrator has concluded that, in the interest of safety, approved airborne weather radar should be made a required item of equipment at the earliest practicable date for transport category airplanes used in passenger operations under the provisions of Parts 40, 41, or 42 of the Civil Air Regulations, with the exception of Curtiss-Wright C-46 airplanes. The C-46 has been specifically exempted

since it was not originally certificated under transport category rules. The notice of proposed rule making did not make this point clear.

The draft release proposed to allow 6 months for the procurement and installation of required radar equipment. However, in consideration of comments received and upon further investigation, the problems associated with the procurement and installation of the airborne radar equipment reasonably appear to require a longer period of time for the industry to comply with this regulation. The airlines have stated that the installation of the airborne radar equipment requires approximately 1,450 hours per airplane and some airplanes may require more time because of necessary modifications. Also, the manufacturers may not be able to furnish the total number of airborne radar units for all airplanes within the proposed six-month period. These problems, together with the problems associated with the scheduling of airplanes for maintenance and overhaul, as well as for the installation of airborne radar equipment, have been considered in establishing the time allowed for the industry to meet this regulation. Upon these considerations the Administrator has determined that except for turbine-powered airplanes, a greater period of time should be allowed for the orderly procurement and installation of required equipment in order to avoid imposing any undue hardship upon operators of airplanes who are subject to this regulation. Accordingly, July 1, 1960, has been established as the date after which approved airborne weather radar will become required equipment for all turbine-powered airplanes used in the carriage of passengers under the provisions of Parts 40, 41, or 42 of the Civil Air Regulations. Since all turbine-powered aircraft subject to this regulation are, with very few exceptions, now equipped or are scheduled to be equipped

*Except as otherwise specified in this Special Regulation.

with airborne weather radar prior to July 1, 1960, it appears that this compliance date will provide an adequate period of time to procure the required equipment and install it in those few remaining turbine-powered aircraft. January 1, 1961, has been established as the compliance date for certain other transport category airplanes specified in section 1(b) and used in passenger operations. Since approximately 80 percent of such airplanes used in passenger operations already have radar equipment installed, it appears that the January 1, 1961, compliance date will provide the operators with an adequate period of time to procure the required equipment and install it in the balance of such airplanes. After January 1, 1962, approved airborne weather radar will be required equipment for the remaining airplanes certificated under the transport category rules, except for Curtiss-Wright C-46 airplanes, and used in passenger operations under Parts 40, 41, or 42 of the Civil Air Regulations.

For the information of the operators, a note has been added to section 1(c) to indicate some of the transport category airplanes in current use which will have to have such equipment by January 1, 1962.

Technical Standard Order C-63, adopted by the Administrator, effective December 1, 1959 (24 F.R. 9262), contains the minimum performance standards for the approval of airborne weather radar equipment required by this regulation. Under the provisions of this Technical Standard Order, airborne weather radar equipment approved prior to the effective date of that order will also be approved for installation under this regulation.

To provide for the accomplishment of an orderly installation of the required airborne weather radar equipment, each operator conducting passenger operations under the provisions of Part 40; 41, or 42 of the Civil Air Regulations is required by section 2 of this regulation to establish a schedule for the progressive completion of such radar installations on its transport category airplanes on or before the dates specified therein. On or before July 1, 1960, a copy of the schedule required by paragraph (a) of section 2 shall be submitted to an authorized representative of the Administrator, together with a list of any airplanes the operator intends to discontinue using in the carriage of passengers prior to the date on which radar equipment must be installed.

Equipment requirements for dispatch and continuation of flight are described in section 3 of this regulation. Draft Release 59-10 proposed to require the radar equipment to be in operation for all IFR operations, and for night VFR operations when thunderstorms or severe weather conditions were forecast for the flight plan route during the time of flight. However, in the light of comments received, it appears that the original proposal would be unreasonably restrictive. Accordingly, the original proposal has been modified so as to bring the dispatch rule into accord with the capabilities of the radar equipment required to be installed. Thus, the dispatching rule prescribed herein provides that no airplane subject to this regulation shall be dispatched under IFR or night VFR conditions when current weather reports indicate that thunderstorms, or other potentially hazardous weather conditions detectable by airborne weather radar, may reasonably be

expected to be encountered along the route to be flown, unless the approved airborne weather radar equipment is in a satisfactory operating condition. Should such equipment become inoperative en route, the airplane must be operated in accordance with the instructions and procedures specified in the operations manual for such occurrence. It should be noted that these dispatch and en route rules will apply after March 31, 1960, to all transport category airplanes subject to this regulation that have approved airborne weather radar equipment installed even though such equipment is not required to be installed until a later date. It should also be noted that approval of the instructions and procedures for the continuation of flight, in the event the radar equipment becomes inoperative en route, will be required at such time as the particular aircraft is required to have approved airborne weather radar equipment installed. In order to permit adequate time for the review of such instructions and procedures the operator should submit them to the assigned air carrier inspector at least 30 days prior to the required approval date. In this regard, the Federal Aviation Agency expects all air carrier aircraft not equipped with airborne weather radar to be operated strictly in accordance with procedures specified in the air carrier's operations manual, when there is a possibility of encountering potentially hazardous weather conditions.

Section 4 expressly exempts from the provisions of this regulation airplanes used for the carriage of passengers solely within the States of Alaska and Hawaii. These operations have been excluded because thunderstorms and other potentially hazardous meteorological condi-

ions detectable by radar rarely occur in those areas. The language of section 4 also makes it clear that the provisions of this regulation are not intended to be applicable to a transport category airplane during the conduct of a bona fide all-cargo, training, test, or ferry flight.

It will be noted that helicopters have not been made subject to this regulation. Upon further consideration of the original proposal, the Administrator has concluded that the installation of radar equipment is not a necessary safety requirement for helicopters at this time. Finally, attention is directed to the fact that large nontransport category airplanes presently being used in passenger service have been omitted from the list of airplanes subject to this regulation, as for example, C-46, DC-3 and L-18 type airplanes. However, the Federal Aviation Agency will continue to give active consideration to the necessity of requiring approved radar equipment to be installed on such airplanes.

This special regulation is being promulgated in lieu of individual amendments to Parts 40, 41, and 42 of the Civil Air Regulations because such a regulation is considered the most expedient method of implementing the original proposal.

Interested persons have been afforded an opportunity to participate in the making of this regulation (24 F.R. 5847), and due consideration has been given to all relevant matter presented.

In consideration of the foregoing, the Administrator of the Federal Aviation Agency hereby makes and promulgates the following Special Civil Air Regulation:

1. *Airborne weather radar equipment requirement.* After the dates specified, the following transport category airplanes shall

not be used for the carriage of passengers under the provisions of Parts 40, 41, or 42 of the Civil Air Regulations, unless approved airborne weather radar equipment is installed in such airplanes:

(a) July 1, 1960, for all turbine-powered airplanes certificated under the transport category rules.

(b) January 1, 1961, for the airplane types listed below:

Douglas DC-7 Series,
Douglas DC-6 Series, and
Lockheed 1049 and 1649 Series.

(c) January 1, 1962, for all airplanes certificated under the transport category rules, except C-46 type airplanes.

NOTE: Airplanes subject to the provisions of paragraph (c) of this section include, but are not limited to, the following types: Boeing 377; Convair 240, 340, and 440; Lockheed 049 and 749; Martin 202 and 404; and Douglas DC-4.

2. *Schedule for installation of equipment.*

(a) Each operator conducting passenger operations under the provisions of Parts 40, 41, or 42 of the Civil Air Regulations with transport category airplanes on which airborne weather is not installed, shall establish a schedule for the progressive completion of such radar installations, in accordance with the provisions of section 1 of this regulation. The schedule shall provide for the completion of all required radar installations on or before the dates specified in section 1 of this regulation, and the completion of at least 40 percent of the required installations on or before the following dates:

(1) August 1, 1960, for airplanes of the types specified in section 1(b), and

(2) February 1, 1961, for airplanes of the types specified in section 1(c).

(b) On or before July 1, 1960, a copy of the schedule required by paragraph (a) of this section shall be submitted to an authorized representative of the Administrator, together with a list of any airplanes the operator intends to discontinue using in the carriage of passengers prior to the date on which radar equipment must be installed

3. *Requirement for dispatch and continuance of flight.* After March 31, 1960, all transport category airplanes having approved airborne weather radar installed shall be operated in accordance with the following rules when used in passenger operations under Parts 40, 41, or 42:

(a) *Dispatch.* No airplane shall be dispatched (or flight of an airplane started under the provisions of Part 43) under IFR or night VFR conditions when current weather reports indicate thunderstorms, or other potentially hazardous weather conditions which can be detected by airborne weather radar, may reasonably be expected to be encountered along the route to be flown, unless approved airborne weather radar equipment is installed in the airplane and is in a satisfactory operating condition.

(b) *En route.* In the event the airborne weather radar becomes inoperative en route, the airplane shall be operated in accordance with the instructions and procedures specified in the operations manual for such occurrence. After the date specified by section 1 of this regulation for the mandatory installation of approved airborne weather radar on the type of airplane involved, such instructions and procedures shall meet with the approval of an authorized representative of the Administrator.

4. *Exceptions.* The provisions of this regulation shall not apply to those airplanes used solely within the States of Alaska or Hawaii, or during all-cargo, training, test, or ferry flights.

5. *Effective date.* Except as otherwise specified, this regulation shall become effective February 15, 1960.

(Secs. 313(a), 601, 604, 605; 72 Stat. 752, 775, 778; 49 U.S.C. 1354, 1421, 1424, 1425)

Issued in Washington, D.C., on January 7, 1960.

E. R. QUESADA,
Administrator.

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