VOLUME 4. AIRCRAFT EQUIPMENT AND OPERATIONAL AUTHORIZATIONS

CHAPTER 2. ALL-WEATHER TERMINAL AREA OPERATIONS

SECTION 4. CATEGORY I OPERATIONS

531. GENERAL

A. This section provides the Federal Aviation Administration (FAA) inspectors with the necessary concepts and direction and guidance for evaluating and approving or denying operator requests for authorization to conduct Category I (CAT I) all-weather terminal area (AWTA) Instrument Flight Rules (IFR) approach and landing operations. This information must be used when an operator applies for an authorization to use any of the following in CAT I operations:

- aircraft
- airborne, ground-based, or space-based equipment
- operational procedures that are new to the operator

B. It must also be used when an operator applies to operate at airports or on runways where there are special AWTA IFR operational requirements or procedures which the operator has not previously complied with or used. This section amplifies the general concepts, policies, and direction and guidance provided in previous sections 1, 2, and 3 of this chapter. Specific standards are provided for evaluating CAT I AWTA operations using airborne and ground-based or space-based equipment which have well understood operational characteristics and limitations. In cases where an operator requests approval to conduct CAT I AWTA operations using equipment, concepts, and/or procedures not covered in these standards, a request for policy and direction and guidance shall be forwarded through the regional flight standards division to AFS-400.

533. DEFINITION OF CAT I APPROACH AND LANDING OPERATIONS. For the purpose of this order, CAT I AWTA operations are defined as all approach and landing operations conducted under IFR weather conditions in accordance with an instrument approach procedure using CAT I operating minimums. CAT I operating minimums specify a minimum IFR altitude/height (Minimum Descent Altitude (MDA) or Decision Height (DH)) not lower than the equivalent of 200 feet above the touchdown zone and a visibility/Runway Visual Value (RVV) not lower than the equivalent of 1/2 statute mile or Runway Visual Range (RVR) 1800. All IFR AWTA operations with operating minimums of less than MDA/DH of 200 feet and/or with a visibility/RVV of less than 1/2 statute mile or less than RVR 1800 are either CAT II or CAT III operations.

A. Types of CAT I Operations. CAT I operations include both precision and nonprecision straight-in instrument approaches as well as those instrument approaches which require a circling maneuver to complete a landing on the intended runway. When authorized by the instrument approach procedure, a circling maneuver can be used to visually maneuver the aircraft to a landing after completion of the instrument approach to circling MDA.

B. Objective of CAT I AWTA Operations.

(1) The essential difference between an approach to a runway made under visual flight rules (VFR approach) and a CAT I AWTA operation (instrument approach) is that an instrument approach procedure is required to safely accomplish the approach and landing or missed approach. The primary objective of a CAT I AWTA operation is twofold.

(a) First, the operation must provide for the safe and orderly transition of an aircraft, under instrument flight conditions, from the en route cruising phase of flight through the initial approach segments to a point on final approach from which a visual landing can be made.

(b) Secondly, if a visual landing cannot be accomplished, the CAT I AWTA operation must provide a missed approach that can be safely executed throughout the missed approach segment for a transition back to the en route structure for diversion to an alternate airport.

(2) To meet these objectives, an instrument approach procedure must define the tracks to be flown with the associated heights and must specify the minimum heights at which the required obstacle clearances are assured when an aircraft is flown in IFR conditions.

535. GENERIC CAT I OPERATIONAL CONCEPTS. The weather and environmental conditions encountered in CAT I AWTA operations may result in the restriction of seeing-conditions to the extent that the external visual references necessary for controlling the aircraft by visual means

are not available during all segments of the approach. Therefore, to a certain point in the approach, the aircraft must be operated and controlled by reference to flight instruments and navigational instruments, and then it must be operated by reference to a combination of flight instruments and external visual information.

A. Purpose of Operating Minimums. CAT I operating procedures and minimums are established to ensure that the desired level of safety is achieved in the reduced seeing-conditions associated with such operations. The purpose of operating minimums is to ensure that the combination of information available from the aircraft instruments and external visual sources is sufficient for the safe operation of the aircraft along the desired flightpath. Operating minimums establish minimum safe heights for instrument flight and the minimum visibility/RVV/RVR necessary for the safe completion of the approach and landing operation being conducted by external visual reference. As external visual information decreases due to reduced seeing-conditions, there must be an increase in the quality and quantity of instrument information and an increase in the proficiency of the flightcrew to maintain the desired level of safety (see section 2).

B. Generic Operating Minimum Relationships. Operating minimums (MDA/DH and VIS/RVV/RVR) for CAT I operations are usually determined by considering the tasks a pilot must perform after reaching the decision point (DH or MDA/Missed Approach Point (MAP)) to complete the landing. As a general rule, the minimum required seeing-condition (VIS/RVV/RVR) is higher if the pilot has to establish visual reference at a higher altitude because of obstacles or limitations in the ground-based or space-based electronic guidance system. In addition, operating minimums are higher if the pilot has to establish better seeing-conditions due to the difficulty of the required tasks for the safe completion of the landing (for example, circling maneuver). Nonprecision approaches usually do not provide an electronic glidepath and the guidance provided is less precise than when precision approach equipment is used. As a result, larger maneuvers are generally required to visually align the aircraft with the runway and to establish the aircraft on a proper visual glidepath so as to touchdown within the touchdown zone. These larger maneuvers not only increase the level of difficulty in completing the landing but also must begin farther from the landing threshold for successful landing completion. Therefore, nonprecision approaches usually require better seeing-conditions than precision approaches. Precision approaches usually permit the pilot to maneuver the aircraft by reference to instruments to a position more closely aligned with the runway and the proper glidepath. Hence, lower operating minimums may be used, because smaller maneuvers are required to touchdown within the touchdown zone. The generic factors which must be considered in establishing operating minimums are discussed in more detail in sections 2 and 3 of this chapter.

537. FUNDAMENTAL OPERATING PRINCIPLES.

A. CAT I operating minimums are established on two fundamental principles.

(1) The first principle is that the flightcrew may have acquired only the minimum aeronautical knowledge, experience, skill, qualifications and training required by Title 14 of the Code of Federal Regulations (14 CFR) parts 61 and 91 for CAT I operations.

(2) The second principle is that only the minimum airborne and ground-based or space-based equipment required for CAT I operations by the aircraft certification rules and 14 CFR parts 91 and 97 will be available.

B. The assumptions and criteria used in aircraft certification and public instrument approach procedure design must be based on these principles. The fundamental objective which must be met during aircraft certification and instrument approach procedure design is to ensure that flightcrews and aircraft that meet only the minimum requirements of parts 61and 91 can safely conduct operations using CAT I minimums. Any special equipment or procedures necessary to achieve this objective must be specified on the airworthiness certification basis of the aircraft (or supplemental type certificate) and/or the FAA-approved Aircraft Flight Manual. Any requirement for special training, knowledge, or skills is not an acceptable means of meeting this fundamental objective because there are no regulatory provisions in part 61 or part 91 which can be used to enforce such requirements. Aircraft which cannot be safely operated with CAT I operating minimums using flightcrews that meet only minimum regulatory requirements shall not be certificated or otherwise approved for IFR CAT I operations. The design criteria for CAT I special instrument approach procedures used by 14 CFR parts 121 and 135 certificate holder can include special credit for the use of special airborne or ground-based equipment, special operating procedures, and special training.

539. CAT I OPERATING MINIMUMS FOR PUBLIC INSTRUMENT APPROACHES. The criteria for operating minimums associated with public instrument approaches are established in 14 CFR part 97 (U.S. TERPS) for each of the various types of approaches (such as NBD, VOR, LOC, ILS, MLS). Standard operating minimums have also been established for each of the various NAVAIDs and runway lighting system combinations currently in use. Reductions in operating minimums below the basic values established for each NAVAID are based primarily on the use of approach and runway lighting systems. These lighting systems are necessary to increase the conspicuity of the landing surface, which in turn enhances the pilot's ability to use external visual references to control and maneuver the aircraft in reduced seeing-conditions.

A. Lighting System Credits. All straight-in precision operating minimums below 3/4 statute mile VIS or RVR 4000 (3/4 statute mile VIS or RVR 3500 for helicopters) are based on the use of ground-based visual aids to enhance seeing-conditions during the final stages of approach and landing operations (deceleration for helicopters). These reductions are known as lighting system credits and cannot be used to reduce operating minimums for circling maneuvers due to the large area required for safe maneuvering (turn radius) at the various speeds used. Therefore, operating minimum reductions based on lighting credits can only be authorized for instrument approaches to runways that provide a straight-in landing capability. The standard minimum IFR altitudes cannot be reduced due to obstacle limitations and/or NAVAID signal limitations. As such, reductions in operating minimums below the basic values established for each NAVAID are expressed only as reductions in the visibility/RVV/RVR required to safely conduct the approach. The minimums for the various NAVAIDs and lighting system combinations are specified in U.S. TERPS and in Operations Specifications (OpSpecs) C053 and H103.

B. Nonprecision Straight-In Minimums. The lowest permissible minimums for Categories A, B, and C aircraft during the conduct of straight-in nonprecision instrument approach procedures (IAP) are height above touchdown(HAT) 250 and 1/2 statute mile VIS or RVR 2400. The lowest permissible minimums for Category D airplanes conducting straight-in nonprecision instrument approach procedures are HAT 250 and 1 statute mile VIS or RVR 5000. The lowest permissible minimums for helicopters operated at 90 knots or less are HAT 250 and 1/4 statute mile VIS or RVR 1600. These minimums for helicopters operated at more than 90 knots are HAT 250 and 1/2 statute mile VIS or RVR 2400. These minimums are the lowest authorized for nonprecision approaches that are restricted to runways which are equipped with MALSR, SSALR, ALSF-1, or ALSF-2 approach lighting systems.

C. Precision Straight-In Minimums. The lowest permissible minimums for all airplanes conducting straight-in precision instrument approach procedures are HAT 200 and RVR 1800. The lowest permissible minimums for helicopters is 1/4 statute mile VIS or RVR 1200. These basic minimums are the lowest authorized for precision approaches and are restricted to runways that are equipped with a lighting system consisting of touchdown zone and centerline lights and MALSR, SSALR, and ALSF-1 or ALSF-2 approach lighting systems.

541. BASIC AIR CARRIER OPERATING MINIMUMS. Although part 97 establishes standard minimums for the various NAVAIDs and lighting system combinations, these standard minimums cannot automatically be used by 14 CFR parts 121 and 135 certificate holders. Two classes of operating minimums are established for parts 121 and 135 operators. These classes of operating minimums are "basic air carrier minimums" and "standard minimums." For the purposes of this handbook, the basic air carrier minimums include high-minimum pilot in command (PIC) requirements and basic turbojet requirements. These basic air carrier minimums are usually higher than the standard minimums prescribed by part 97 for the various NAVAIDs and lighting system combinations. The basic air carrier minimums must be used by all parts 121 and 135 operators until the requirements for special airborne equipment, pilot qualification, pilot training, and/or experience requirements for standard operating minimums are met. The Principal Operations Inspector (POI) may then authorize the certificate holder to use the standard operating minimums. "Standard operating minimums," as used in this handbook, are the set of minimums that have been called "lower than standard minimums" in Advisory Circular (AC) 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach, as amended, and in previous versions of the OpSpecs.

A. High Minimum Pilots-in-Command (PIC). The degraded seeing-conditions and increased difficulty in piloting tasks encountered during CAT I approach and landing operations make it necessary for PICs to acquire a certain amount of flight experience before operating to the lowest authorized CAT I minimums. The objective of this flight experience requirement is to ensure that the pilot is fully aware of the aircraft's equipment capabilities and limitations, the available external visual cues, and the aircraft's handling characteristics.

(1) Increased Operating Minimums. The flight experience necessary to meet this objective is specified in part 121, § 121.652 or part 135, § 135.225(d), as applicable. High-minimum PIC requirements for part 135 operations are applicable only to turbine-powered airplanes (turbojet or turbopropeller). These rules require those PICs who do not meet these experience requirements (high-minimum PICs) to increase the published MDA/DH by 100 feet and the published VIS/RVV by 1/2 statute mile or the RVR equivalent. The RVR which must be used when an RVR is published and available is the applicable high-minimum-PIC-RVR value specified in OpSpec C054. The increased operating minimums for high-minimum PICs always result in operating minimums that are higher than standard minimums. For example, if the minimums published for an ILS approach to a certain runway are HAT 200/RVR 1800, the operating minimums which must be used by a high-minimum PIC for an approach to that runway must not be lower than HAT 300 and RVR 4500 (HAT 200 + 100 feet and the high-minimum PIC equivalent of RVR 1800, which is RVR 4500, as specified in OpSpec C054). If the minimums published for a precision approach were HAT 200 and a VIS of 3/4 statute mile, the high-minimum PIC would have to use a HAT of 300 and a VIS of 1-1/4 statute miles. Therefore, when dispatching or releasing a flight, the increased operating minimums for high-minimum PICs and

the reported and/or forecasted weather conditions at the destination airport must be considered.

(2) Specific Operating Rule Provisions. Sections 121.652 and 135.225(d) are similar; however, significant differences exist in the specific details of these rules.

(a) Section 121.652. This rule applies to all airplanes operated under part 121. It raises high-minimum PIC operating minimums by HAT 100 feet and visibility by 1/2 statute mile or by the RVR equivalent. The high-minimum, PIC-RVR equivalents are specified in the OpSpecs. The rule specifies that the MDA or DH and visibility minimum required for a high-minimum PIC does not have to be raised above the conditions required to designate the airport as an alternate airport. The new method for determining alternate minimums, however, is to add a buffer to the HAT/height above airport (HAA) and visibility or RVR authorized for landing. This method negates the provision of this rule since alternate minimums will always be higher than the high-minimum PIC's landing minimums. The landing minimums for high-minimum PICs at destination airports are always determined by adding 100 feet to the HAT/HAA and 1/2 statute mile to the visibility authorized for landing or by using the high-minimum, PIC-RVR equivalents in OpSpecs C054 when RVR is available. This rule establishes HAT 300 feet and 1 statute mile (or the RVR equivalent as low as RVR 4500) as the lowest straight-in precision approach operating minimums for high-minimum PICs. This rule also establishes HAT 300 and 1 statute mile (or the RVR equivalent as low as RVR 5000) as the lowest straight-in nonprecision approach operating minimum for high-minimum PICs. This rule also permits the 100-hour flight experience requirement to be reduced by up to 50% by substituting one landing for 1 required hour of flight experience, provided the PIC has at least 100 hours' PIC time in another type airplane in part 121 operations.

(b) Section 135.225(d). This rule applies only to turbine-powered (turbojet and turbopropeller) airplanes. It raises operating minimums for high-minimum PICs by HAT 100 feet and visibility by 1/2 statute mile. When RVR minimums are published and RVR reports are available, the high-minimum, PIC-RVR equivalent values specified in the operations specifications must be used. The operating minimums for part 135 high-minimum PICs are the same as those for part 121 PICs (see subparagraph 541 A(2)(a)). The rule also specifies that the MDA or DH and visibility minimums required for high-minimum PICs does not have to be raised above the ceiling and visibility requirements for the airport to be designated as an alternate airport. The new method for determining alternate minimums, however, negates this provision of this rule (see discussion in paragraph 541 A(2)(a)). This rule does not permit a reduction to the 100-hour flight experience requirement.

B. Basic Turbojet Minimum. A basic turbojet VIS/RVR operating minimum has been established for all turbojet airplanes operated under parts 121 and 135. The basic turbojet minimum for straight-in nonprecision and precision approaches is 3/4 statute mile visibility or RVR 4000. Any minimum less than the basic turbojet minimum is not authorized in turbojet aircraft until special requirements are met. When the airplane equipment, the runway lighting/marking systems, and the pilots are in compliance and qualified in accordance with AC 120-29 (as amended) and this handbook, the lowest minimums that have been established for various approved approach and runway lighting/marking configurations may be authorized. The turbojet minimums for each of the approved approach and runway lighting/marking configurations are specified in OpSpecs C053 and C054.

543. STANDARD AIR CARRIER OPERATING MINIMUMS. Standard operating minimums are established in part 97 for the various combinations of NAVAIDs and visual systems used for AWTA operations. Air carriers can be authorized to use standard circling minimums in accordance with OpSpecs C053 and/or H103 (see paragraph 543A). An air carrier can also be authorized to use the standard minimums for straight-in precision and nonprecision approaches when all of the high-minimum PIC and, if applicable, basic turbojet requirements have been met. These requirements include special airborne equipment, and special pilot training, qualification, and/or special operating experience (see paragraph 541 and AC 120-29, as amended).

A. Standard Minimums for Circling Maneuvers. The standard minimums for these maneuvers are based on the highest speed used during a particular circling maneuver. The highest speed to be flown (speed category) during the maneuver must be used to determine the appropriate minimums. This speed must be used to determine the appropriate minimums to ensure that the aircraft will remain within the designated circling maneuver area, thereby assuring obstacle clearance. For parts 121 and 135 operations, the standard operating minimums for circling maneuvers for all aircraft are specified in OpSpecs C053 and H103. The operating minimums are specified in terms of HAA and visibility as follows:

Speed Category	HAA	Visibility (SM)
Less than 91 kts	350	1
91 to 120 kts	450	1
121 to 140 kts	450	1
141 to 165 kts	550	2
Above 165 kts	1000	3

B. Reciprocating/Turbopropeller Airplanes and All Helicopters. The standard CAT I minimums can be used for reciprocating or turbopropeller airplanes and all helicopters at those runways where the required visual aids are serviceable and the instrument approach procedures specify minimums equal to or greater than the standard operating

minimums specified in the operations specifications. If the flightcrew meets the high-minimum PIC flight experience, additional flightcrew training and/or airborne equipment are not usually required as a prerequisite for being authorized to use the standard minimums.

C. Turbojet, Turbofan, and Propfan Airplanes. The degraded seeing-conditions encountered when operating to the standard CAT I minimums significantly increases the difficulty of the piloting tasks associated with certain airplanes. In particular, when turbojet, turbofan, or propfan airplanes are operated using the standard CAT I minimums, the minimum flightcrew training and airborne and ground-based or space-based equipment do not assure, under certain conditions, that operations can be conducted safely. Therefore, the standard CAT I operating minimums must not be authorized for operations with turbojet, turbofan, or propfan airplanes until the flightcrew and the airplane airborne equipment are specifically qualified in accordance with this handbook and AC 120-29 (as amended) for those minimums. The conditions necessary for safe operations using the standard minimums with these airplanes include the following:

- Special airborne equipment
- Special ground-based electronic equipment
- Special ground-based visual aids
- Additional runway field length
- Special training and qualification
- Special operating procedures
- Special maintenance requirements

545. AUTHORIZED CAT I INSTRUMENT APPROACH PROCEDURES. All operations conducted under IFR in CAT I weather conditions (except contact approaches) must be conducted in accordance with an approved instrument approach procedure. OpSpecs C051, C052, H101, and H102 specify the instrument approach procedures which can be authorized for use in CAT I operations. If the flightcrew is properly trained and the aircraft is properly equipped and maintained, a U.S. operator is authorized to conduct CAT I operations at airports and runways where the instrument approach procedure is prescribed or developed in accordance with OpSpecs C051 and H101. OpSpecs C053, C054, H103, and H104 establish the lowest landing minimums which can be authorized, under any circumstances, for CAT I operations by U.S. air carriers. FAA inspectors shall not authorize certificate holders to use landing minimums lower than these values. Additionally, inspectors shall not authorize the use of instrument approach procedures and/or landing minimums for CAT I operations at foreign airports unless the provisions of FAA Order 8260.31B and the OpSpecs are satisfactorily met. The OpSpecs establish the generic requirements and criteria for operations at these airports. FAA Order 8260.31B establishes the detailed criteria, procedures, and policy for authorizing, restricting, and/or denying the use of foreign terminal instrument approach procedures by U.S. air carriers. Paragraphs 453 through 459 of this chapter provide a more detailed discussion on the instrument approach procedures that can be used by U.S. air carriers and the proper methods for authorizing their use.

547. BASIC IFR AND STANDARD CAT I OPERATING PRACTICES. As CAT I AWTA operations evolved, certain operating practices and procedures have been shown to be effective in providing enhanced situational awareness in the cockpit during IFR flight. These practices and procedures provide an effective means for ensuring that flight crewmembers maintain a common understanding of the aircraft's flight progress, including the actions and sequence of actions that must be performed for continued safe flight and landing. These standard operating practices and procedures apply to the conduct of instrument approach procedures, altitude awareness, ascent and descent rate management, and the use of checklists. When properly and consistently applied, the standard operating practices discussed in this paragraph have been shown to significantly reduce the potential for misunderstandings and accidents or serious incidents. These practices enhance flight safety, and are good examples of safe operating practices and procedures. It is national policy and direction and guidance that each operator must develop standard operating procedures for CAT I operations, and that these practices must be included in operator manuals, training programs, and operating procedures. When evaluating an operator's practices and procedures, an inspector should use the practices discussed in this paragraph as the national norm. The inspector should ensure that any operating procedures used by an operator are equivalent to these norms. All basic IFR and CAT I operations conducted by parts 121 and 135 operators should be conducted in accordance with these standard operating practices and procedures (or their approved equivalents).

A. Basic IFR Operating Practices. The operating practices and procedures for basic IFR operations are related to altitude awareness, ascent and descent rate management, and the use of checklists. The basic purpose of these practices is to provide a means for the flightcrew to continuously function as a coordinated team to ensure the safe completion of the planned flight. This is accomplished by establishing crew duties and responsibilities that clearly define each flight crewmember's role during a particular operation. Under normal circumstances, at least one pilot should maintain a full-time instrument reference to monitor flight progress.

(1) Aircraft Control Responsibilities. Operational practices and procedures must be established to ensure that there is never any doubt about who is the pilot-flying (PF) and who is the pilot-not-flying (PNF) at any particular point in the flight. The PNF should monitor and assist the PF by making call-outs for each significant transition point, event,

or failure condition, and by performing any actions requested by the PF or required in the established operating procedures. If the primary responsibility for controlling the aircraft is transferred from one pilot to the other during any portion of the flight, the procedures used should clearly describe how this transfer of responsibility is announced to the other flight crewmembers.

(2) Cockpit Checklist and Procedures. Checklists and cockpit check procedures must be established to ensure that all actions required for a particular flight are properly performed. These checklists and the associated operating practices and procedures should be designed to minimize the attention required inside the cockpit without lessening the effectiveness of cockpit check procedures. The checklists and cockpit procedures used should incorporate the following general principles:

(a) The checklist procedures should include only those items which are essential for safe operation.

(b) The operating procedures should be arranged so that one pilot can be looking outside with a minimum of interruption or distraction from visual scanning tasks while the other pilot is performing tasks inside the cockpit.

(c) The cockpit procedures should be arranged to minimize the cockpit checking which must be done at critical times such as during climb or descent and during departures or arrivals in congested areas.

(d) The operating procedures and the management of the flight deck should be arranged to enhance the detection of potential mid-air collision threats during those phases of flight where threats are likely to occur, such as departure, climb, descent, and arrival.

(e) The arrangement of checklist items and the printing (format presentation) used on the checklists should not involve prolonged concentration for the pilots' eyes to adjust to changes from distant to near vision.

(3) Standard Call-outs. Standard call-outs for basic IFR operations should be established to ensure that the flightcrew functions as a well-coordinated team and maintains the situational awareness necessary for safe operation of the aircraft. The PNF should be assigned the responsibility for monitoring the flight progress and for providing call-outs to the PF for each significant transition point, event, or failure condition. The following additional PNF call-outs should also be used as standard operating practices for all basic IFR operations:

(a) During climb to assigned altitude, the PNF should provide a call-out when passing through the transition altitude (as a reminder to reset the altimeters) and when approaching one thousand feet below assigned altitude.

(b) During cruise, the PNF should provide a call-out when the aircraft altitude deviates by 200 feet or more from the assigned altitude.

(c) During descent from en route flight altitude to initial approach altitude, the PNF should provide a call-out when approaching 1000 feet above the assigned altitude, an altitude where a speed reduction is required (e.g. 10,000 feet in the U.S.), 1000 feet above the initial approach altitude (above field elevation for approaches in VFR conditions), and when passing the transition level.

B. Standard CAT I Operating Practices. The standard operating practices and procedures for CAT I AWTA operations are related to proper approach and missed approach preparation, altitude awareness, terrain and obstacle awareness, airspeed control, propulsion system control, flightpath control, descent rate management, the use and limitations of NAVAIDs and of visual cues, and the use of checklists. The basic purpose of these standard procedures and practices is to provide a means for the flightcrew to continuously function as a well-coordinated team for ensuring the safe completion of the instrument approach and the subsequent landing or missed approach. The following standard operating practices and procedures, which are in addition to the standards required for basic IFR operations, should be established for CAT I operations:

(1) Approach and Missed Approach Preparation. Before executing any instrument approach procedure, the flightcrew should review the approach procedure before the final approach fix. As a minimum, this review should include the field elevation, the minimum safe altitude (MSA), the type of approach, the final approach course, the MDA or DH, the controlling minimums, and the missed approach procedure.

(2) Checklist Completion. For all straight-in approaches conducted in IFR conditions, the final checklist ("before landing checklist") must be completed before the aircraft passes 1000 feet above the elevation of the touchdown zone. For circling approaches conducted in IFR conditions, all checklist items except the final landing flap configuration must be completed before the aircraft passes 1000 feet above the airport elevation, and the checklist must be completed before passing the MDA or 500 feet, whichever is lower. For approaches conducted in VFR conditions, all checklist items must be completed before passing 500 feet above the touchdown zone elevation.

(3) Stabilized Approach Concept. All approaches conducted with turbojet, turbofan, and propfan aircraft must be conducted in accordance with the stabilized approach concept (see paragraph 511). The use of the stabilized approach concept by all other aircraft is strongly recommended because of its potential safety benefits.

(4) Generic CAT I Call-outs. Generic call-outs for CAT I operations should be established to ensure that the flightcrew functions as a well-coordinated team and maintains the situational awareness necessary for the safe operation of the aircraft. As a minimum, the following generic

PNF call-outs, in addition to the call-outs specified for basic IFR operations, should be used during CAT I operations:

(a) Beginning the Final Approach Segment: Just before beginning the final approach segment, a call-out should be provided to cross-check the altimeter settings and instrument indications and to confirm the status of warning flags for the flight and navigation instruments and other critical systems. During flight director or autocoupled approaches, proper flight director and/or autopilot mode engagement and lateral and/or vertical navigational signal tracking should be confirmed.

(b) Rate of Descent Call-outs: If the flight altitude is less than 2000 feet above ground level (AGL), the PNF should provide a call-out when the rate of descent exceeds 2000 feet per minute (FPM). Additionally, a call-out should be provided when the rate of descent exceeds 1000 FPM if the flight altitude is less than 1000 feet AGL.

(c) Altitude Call-outs: The PNF should provide a call-out at 1000 feet above the landing elevation to confirm aircraft configuration and to cross-check the flight and navigation instruments. For approaches conducted in IFR conditions, the PNF should also provide a call-out at 100 feet above the MDA or DH (as applicable) followed by a call-out upon arriving at the MDA or DH. Unless the available external visual references meet the requirements of 14 CFR part 91, § 91.116 for descent below MDA or DH, the PNF should also provide call-outs if the aircraft descends below the authorized MDA or DH. If radio altimeters are installed and operational, call-outs should be provided at 10 foot intervals between 50 feet and touchdown.

(d) Airspeed Call-out: The PNF should provide a call-out at any point in the approach when the airspeed is below the planned speed for the existing aircraft configuration. If the aircraft has entered the final approach segment, a call-out should also be provided when the airspeed exceeds 10 knots above the planned final approach speed.

(e) Visual Cue Call-out: Except for CAT I operations which are conducted in accordance with the standard AWTA operating procedure discussed in paragraph 549, the PNF should provide a call-out when the visual cues required to continue the approach by visual reference are acquired, such as “approach lights” or “runway.” This call-out should not be made unless the available visual cues meet the requirements of § 91.116 for descent below the MDA or DH.

(f) Destabilized Approach Call-out: The PNF should provide a call-out if the approach becomes destabilized. The approach is destabilized if the criteria for a “stabilized approach” are not met and maintained (see paragraph 511).

(g) Approach Profile Call-out: The PNF should provide a call-out if the aircraft deviates from the proper approach profile during any portion of an instrument approach. Furthermore, the PNF should provide a call-out if the aircraft has entered the final approach segment of an ILS/MLS approach and the localizer (azimuth) displacement exceeds 1/3 dot and/or the glideslope (elevation) displacement is greater than one dot. For localizer (azimuth)-based approaches, a call-out should be made if the displacement exceeds 1/3 dot during the final approach segment. For VOR-based approaches, a call-out should be made if the displacement exceeds 2 degrees during the final approach segment. For NDB-based approaches, a call-out should be made if the displacement exceeds 5 degrees during this segment.

549. THE STANDARD AWTA OPERATING PROCEDURE.

A. General. Throughout the evolution of AWTA operations, numerous research programs have investigated various concepts in an attempt to optimize crew duties and responsibilities and to develop the ideal operational practices and procedures for operations in the restricted seeing-conditions associated with these operations. Although the ideal operational procedure has not yet been found, one method of specifying crew duties and responsibilities has been demonstrated to be especially effective, and is beginning to be widely used. For the purpose of this handbook, this particular method of conducting AWTA operations is called the “standard AWTA operating procedure.” The standard AWTA operating approach procedure is based on the use of autocoupled approaches to minimize flightcrew workload and to increase the precision of flightpath control. This concept was also designed to distribute the workload between the two pilots during the critical final approach segment and to provide a smoother transition from instrument to visual flight for completion of the landing. Another advantage to this concept is that the approach will default to a missed approach if any confusion, hesitation, or disorientation occurs at the critical decision point (DH or MDA/MAP). It is national direction and guidance that all operators (except those operators using heads-up display equipment) should be encouraged to use the standard AWTA operating procedure for instrument approaches when the weather conditions are equal to or less than RVR 5000 for nonprecision approaches and RVR 4000 for precision approaches.

B. The Standard AWTA Operating Procedure Concept. The standard AWTA operating procedure specifies a separation of the crew duties and responsibilities for the pilot who manipulates the controls during the landing (the landing-pilot) and the pilot who is not manipulating the controls during the landing (the non-landing pilot).

C. Responsibilities of The Non-Landing Pilot. The non-landing pilot maintains a full-time instrument reference throughout the approach and landing or missed approach. The non-landing pilot also serves as the master monitor of

the flight instruments, navigation instruments, the autoflight system, and other critical aircraft systems.

(1) The non-landing pilot is assigned the responsibility for hands-on control of the aircraft from the beginning of the final approach segment until arrival at DH. At MDA or DH, the non-landing pilot is responsible for making the go-around decision if the landing-pilot does not immediately respond to the "decide" challenge (call-out) at DH or MDA/MAP. If, before passing MDA or DH, the landing-pilot makes the decision to continue the approach and assumes hands-on control of the aircraft, the non-landing pilot relinquishes aircraft control and continues to serve as the master monitor throughout the subsequent landing or, if required, a missed approach.

(2) The non-landing pilot is responsible for hands-on control of the aircraft from the beginning of the final approach segment until arrival at MDA/MAP or DH. Upon arrival at this point, the non-landing pilot is also responsible for immediately executing a go-around and maintaining hands-on control throughout the missed approach segment, unless one of the following three events occurs.

(a) The landing-pilot determines that the aircraft's flightpath is acceptable and the external visual cues are adequate for continuing the approach by visual references. In this case, the landing-pilot assumes hands-on control of the aircraft by a call-out such as, "I've got it" and simultaneously pushes the non-landing pilot's hand from the throttles. This double confirmation (verbal and tactile) is essential for ensuring an orderly transfer of control during this critical flight phase.

(b) The landing-pilot determines that either the flightpath or the external cues are unacceptable and executes a missed approach by assuming hands-on control of the aircraft. The transfer of control should be accomplished in the same manner as previously described.

(c) The landing-pilot detects or strongly suspects an unsafe condition and executes a missed approach by assuming hands-on control of the aircraft in the same manner as previously described.

D. Responsibilities of the Landing-Pilot. The landing-pilot serves as the secondary monitor of the flight instruments and aircraft systems. The landing-pilot has the primary responsibility for evaluating the overall performance of the approach, determining the adequacy of the external visual cues, and for making the decision at MDA/MAP or DH to either continue the approach and landing or to go-around. During the approach, the landing-pilot incorporates external visual cues with the instrument references until reaching 100 feet above MDA/MAP or DH. At 100 feet above MDA or DH, the landing-pilot transitions to head-up scanning to evaluate the adequacy of external visual cues and to begin formulating the decision which must be made before passing MDA/MAP or DH.

(1) If, before passing MDA/MAP or DH, the landing-pilot decides that the aircraft's flightpath is acceptable and the external visual cues are adequate for continuing the approach visually, the landing-pilot assumes hands-on control of the aircraft by making a call-out such as "I've got it" and simultaneously pushes the non-landing pilot's hand from the throttles. The landing-pilot is responsible for manipulating the controls during the landing or throughout the missed approach if a go-around is necessary below MDA or DH.

(2) If the landing-pilot decides that a go-around is necessary before assuming hands-on control of the aircraft, the landing-pilot should give the call-out "go-around," and simultaneously push the throttles toward go-around power. The non-landing pilot will then execute the missed approach. In unusual circumstances, such as when the non-landing pilot hesitates to follow the go-around command, the landing-pilot can execute the missed approach by giving another call-out such as, "I've got it; going around" while simultaneously pushing the non-landing pilot's hand from the throttles and assuming hands-on control of the aircraft.

(3) The landing-pilot must manipulate the controls when operating below the MDA or DH. Therefore, the landing-pilot must execute the missed approach and manipulate the controls throughout the missed approach segment if a go-around is necessary below MDA or DH.

E. The Decision At MDA/MAP or DH. The landing-pilot is responsible for making the landing or go-around decision at MDA/MAP or DH. The non-landing pilot is responsible for making the go-around decision at MDA/MAP or DH if the landing-pilot does not immediately respond to the "decide" challenge (call-out) at MDA/MAP or DH.

551. EVALUATION AND APPROVAL OF CAT I OPERATIONS. The process for evaluating and approving CAT I AWTA operations generally follows the process for approval or acceptance described in volume I, chapter 5, section 6. The discussion in the following paragraphs provides specific criteria and direction related to the evaluation and approval of CAT I operations.

A. Straight-In Approach and Landing Operations. Before an operation can be authorized for the use of CAT I nonprecision and precision straight-in instrument approach procedures, inspectors must evaluate the proposed operation and determine that the operator is competent to safely conduct those procedures. Inspectors must ensure that the operator's program specifies the conditions necessary for the safe conduct of proposed operations. The operator's program should incorporate systems, methods, and procedures that meet the following criteria:

- Program restricts operations to aircraft which are properly equipped and airworthy for the CAT I straight-in approaches to be conducted

- Complies with regulatory requirements specified for the operations
- Meets the requirements of Part B, C, and H of the OpSpecs and the criteria of this handbook
- Provides for accepted, safe operating practices, such as altitude awareness and sterile cockpit procedures
- Meets the criteria of AC 120-29 (as amended), when applicable
- Requires the use of the stabilized approaches when turbojet, turbofan, or propfan airplanes are used
- Program restricts operations to pilots who are properly trained, experienced, qualified, and proficient for the particular operation being conducted (including use of basic air carrier minimums as well as standard minimums)
- Program restricts operations to airports and runways which meet the requirements applicable to straight-in instrument approaches

B. Approaches Requiring Circling Maneuvers. When an operator is authorized to conduct CAT I instrument approaches, the operations specifications automatically authorize the conduct of circling maneuvers in VFR weather conditions (1000 feet ceiling and 3 statute miles visibility). A circling maneuver conducted under this authorization may be performed at the published HAA appropriate for the highest speed in the circling maneuver. However, before circling maneuvers can be conducted with ceilings below 1000 feet and/or visibilities below 3 statute miles, the operator's approved training program must provide for training in the circling maneuver. If an operator intends to conduct circling maneuvers with ceilings below 1000 feet and/or visibilities below 3 statute miles, inspectors must evaluate the operator's training program and determine that it provides adequate instruction and checking of pilots on the circling maneuver. When an operator does not provide training on circling maneuvers, the operator's operating policies and procedures must prohibit circling maneuvers when ceilings and/or visibilities are below 1000 feet and 3 statute miles. Inspectors must also ensure that the certificate holder's overall program specifies the necessary conditions (over and above those required for straight-in approaches) to safely conduct circling maneuvers. The operator's program should incorporate methods, procedures, and training that meet the following criteria:

- Meets the circling maneuver criteria in the OpSpecs
- Requires the circling maneuver to be performed in visual flight conditions
- Provides for safe missed approaches throughout the circling maneuver
- Requires the use of circling maneuver minimums appropriate to the highest speed used in a particular circling maneuver
- Program restricts operations to those airports and runways where circling maneuvers can be safely completed
- Program restricts circling maneuvers with ceilings below 1000 feet and/or visibilities below 3 statute miles to those pilots who are properly trained and checked for the circling maneuver in those weather conditions

C. Visual Approaches. An operator is authorized to conduct visual approaches, provided the conditions specified in the operations specifications are met. For operations at foreign airports, it is important to understand that the term "visual approach" can have a different meaning than the U.S. definition of visual approach. The ICAO definition of a visual approach includes a "contact approach" and does not include requirements to have VFR weather conditions, to be under the control of an air traffic control (ATC) facility, or to be within 35 nautical miles of the destination airport. In both domestic and foreign operations, the operator must comply with the conditions specified in the operations specifications when conducting visual approaches. When authorized to operate in foreign countries, the operator's policies, procedures, and approved training program must ensure that the requirements for visual approaches in foreign countries are adequately addressed.

D. Contact Approaches. Contact approaches, in accordance with the OpSpecs, are authorized only when the operator's approved training program provides training on contact approaches. A contact approach is an authorization to deviate from the prescribed instrument approach procedure (under IFR weather conditions) and to proceed visually to the runway of intended landing. Although the flight is still on an IFR flight plan, and ATC maintains responsibility for the separation of aircraft and wake vortex requirements, the flightcrew does assume total responsibility for navigation and terrain and obstacle avoidance. If an operator does not provide training on contact approaches, its policies and procedures must prohibit pilots from requesting, accepting, or conducting contact approaches. When an operator does provide training on contact approaches, the operator's operating policies and procedures must ensure that the conditions and requirements for accepting and conducting these approaches are clearly stated.

E. Special Instrument Approach Operations. Operators can be authorized to conduct special CAT I approach and landing operations. When authorizing these types of special approaches, inspectors must be assured that the aircraft are properly certificated, equipped, and maintained. In addition, approved training programs and operating policies and procedures must ensure that these operations can be safely conducted. The following discussion addresses the current

types of special CAT I operations which are well developed and understood. If the operator requests approval of other types of special CAT I operations, the request should be forwarded through the Regional Flight Standards Division to AFS-400 for national direction and guidance related to the approval and conduct of the proposed special operation.

(1) Area Navigation (RNAV) Approaches. Operators can be authorized to conduct CAT I Area Navigation (RNAV) approach operations in accordance with OpSpecs C063 and H112. The aircraft must be properly certificated, equipped, and maintained for RNAV approaches in accordance with AC 90-45, Approval of Area Navigation Systems for use in the U.S. National Airspace System, as amended, (or equivalent criteria). In addition the operator's approved training program, operating policies, and procedures must ensure that these operations can be safely conducted. When authorized, the RNAV approaches established in part 97 may be conducted, provided the equipment requirements and procedures specified by the part 97 procedure have been complied with. The operator may also be authorized to conduct other RNAV instrument approach procedures (not listed in part 97) by listing the procedures in OpSpecs C064 and H113.

(2) *Airborne Radar and Offshore Approaches.* An operator can be authorized to conduct CAT I Airborne Radar Approaches (ARAs) and/or Offshore Standard Approach Procedures (OSAPs). The operator's approved training program, equipment installations, and operational policies and procedures must meet the criteria specified in AC 90-80 (as amended) before the operator can be authorized to conduct ARAs and OSAPs. ARAs and OSAPs are authorized by listing the procedure in OpSpec H113.

(3) *Point-In-Space Approaches*. In certain cases, the instrument portions of an instrument approach procedure may deliver the aircraft to a predetermined "point-in-space" instead of to an airport or runway. These types of approaches are intended to provide an IFR descent to a point where sufficient visual reference is available for the pilot to navigate visually for several miles to the airport of intended landing. If the required seeing-conditions are not established before passing this point-in-space, a missed approach can be safely executed. These procedures are useful in the following two situations:

(a) Terrain, obstacles, conflicting air traffic, and/or NAVAIDs limitations can occasionally prevent the establishment of a standard IFR approach procedure to a particular airport or runway. In certain cases where this occurs, an instrument approach can be established to provide an IFR descent to a point a few miles from the airport. Upon arrival at this point-in-space, the flight can then proceed under VFR conditions using pilotage and/or station-referenced VFR Class I navigation to a landing at that airport. These procedures are, in effect, an instrument approach procedure followed by an extended visual segment and are commonly referred to as "fly visuals." In normal circumstances, an authorization to conduct nonprecision approaches automatically authorizes the operator to conduct fly visuals in accordance with part 97 and the OpSpecs.

(b) Helicopter en route descent areas (HEDAs) permit a single instrument procedure to serve many offshore heliports, and significantly reduce the burden of developing numerous standard instrument approach procedures for this dynamic situation. This is particularly useful in offshore operations where heliports frequently exist for short periods of time and the location of the heliport is frequently moved because of operational needs. Once the criteria specified in AC 90-80 (as amended) have been met, HEDAs are authorized by being listed in OpSpec H104.

553. CAT I AIRPORT, RUNWAY, AND GROUND-BASED EQUIPMENT REQUIREMENTS. The suitability of the airports and runways for the type of aircraft used and type of operation being conducted is an integral part of evaluating and approving CAT I AWTA operations. The basic requirements for instrument flight operations and the takeoff and landing performance requirements of the applicable operating rules address the majority of the criteria required for AWTA operations. However, the operational concepts and operating criteria used by the operator in the conduct of AWTA operations are other factors to be considered. Inspectors must determine that the operator fully understands the CAT I AWTA operational requirements and provides the necessary policies, procedures, and training to meet those requirements. The operator must address the requirements for the use of various CAT I operating minimums in company manuals and training programs. When determining the adequacy of airports to support an operator's CAT I operations (including any special requirements for the use of standard air carrier minimums), inspectors must consider whether the operator's overall CAT I program accounts for the following factors:

- Suitability of runways, runway field lengths, taxiways, and other maneuvering areas on the airport
- Suitability of instrument approach procedures and NAVAIDs to be used
- Adequacy of procedures for protection of the runway safety and obstacle-free areas and ILS/MLS critical areas as well as runway and taxiway incursion prevention procedures
- Required ATC facilities and services
- Required safety facilities and services (such as crash, fire, and rescue)
- Weather reporting and forecasting services
- Aeronautical information services (NOTAM, ATIS)
- Use of radio-controlled lighting, if appropriate
- Adequacy of lighting, marking, and other visual aids necessary to support CAT I operations

555. CAT I OPERATIONS USING BASIC AIR CARRIER OPERATING MINIMUMS. This paragraph discusses the evaluation and approval criteria for CAT I operations which are restricted to basic operating minimums. Basic operating minimums include the high-minimum PIC minimums and the basic turbojet minimums (see paragraph 541). This includes precision and nonprecision, with or without circling maneuvers, using standard equipment to conduct instrument approach procedures based on standard ICAO approach and landing NAVAIDs (VOR, VOR/DME, NDB, ILS, MLS) or ATC radar approaches (ASR, Precision Approach Radar (PAR)). Unless specifically stated otherwise, the criteria discussed in this paragraph are applicable to both helicopters and airplanes. The criteria and other pertinent factors discussed in this paragraph are in addition to the airport, runway, and ground-based equipment requirements discussed in the previous paragraph. RNAV and other special instrument approach operations are discussed in paragraph 551E.

A. Airborne Equipment Required for Basic CAT I Operating Minimums. When aircraft and avionics equipment are certificated by the United States, the requirements in parts 61, 91, 121, and/or 135, as appropriate, are taken into consideration. Therefore, aircraft and avionics combinations certificated by the United States for IFR flight are capable of supporting the conduct of CAT I AWTA operations using basic air carrier operating minimums. This applies to reciprocating and turbopropeller airplanes as well as turbojet, turbofan, and propfan airplanes and all helicopters. Therefore, for operations using standard instrument approach procedures based on ICAO standard NAVAIDs and basic operating minimums, the aircraft and avionics airworthiness certification basis and the operating rules define the required airborne systems and equipment. These requirements include the provisions of §§ 91.25, 91.37, 121.305, 121.347, 121.349, 135.163 and 135.165. These requirements are "equipment rules" (that is "the aircraft must be equipped with..."). As such, they are distinctly different from the requirements which must be met to actually conduct an instrument approach procedure.

(1) Airborne Equipment Required for Departure. The "equipment rules" are met when the required equipment is installed and serviceable at the time a flight departs. The redundancy specified in these rules is intended to provide the capability to safely continue and complete an IFR approach and landing (at either a destination or alternate airport) in the event an approach system fails or malfunctions inflight.

(2) Airborne Equipment Required for Conducting Standard Instrument Approach Procedures. The "equipment rules" specifically address the airborne equipment which must be installed and serviceable before departure for basic air carrier operating minimums. Therefore, additional requirements must be specified to address instances where some of the required equipment fails or malfunctions inflight. This is particularly true in situations where the "equipment rules" require redundancy for the purpose of preserving an instrument approach capability in the event a failure occurs. The equipment rules and the operations specifications do not specify in detail the equipment required to initiate a standard instrument approach procedure. However, the operational concepts and regulatory provisions clearly intend and require certain equipment to be serviceable to safely execute a CAT I instrument approach procedure. U.S. TERPS criteria (which is incorporated into part 97 by reference) and ICAO PANS-OPS criteria for instrument approach procedure design clearly require that specific airborne equipment must be serviceable in order to conduct the approach. §91.116 and the OpSpecs require the use of an approved instrument approach procedure for all instrument approach and landing operations conducted in IFR weather conditions (contact approaches are the exception). U.S. TERPS and ICAO PANS-OPS criteria identify instrument approach procedures by the airborne and ground-based or space-based equipment which must be serviceable for final approach guidance (for example VOR, VOR/DME, ILS/DME, Localizer Descent Aid (LDA)). In general, the airborne equipment required to be serviceable in order to safely execute an instrument approach procedure consists of both flight instruments and navigation equipment. As a minimum, the required flight instruments and navigation equipment must permit, under IFR weather conditions, an orderly transition from the en route environment through the initial approach fix to the DH or MDA/MAP. Thereafter, if visual reference cannot be established, the flight instruments and navigation equipment must permit the execution of a missed approach and transition back to the en route environment for a diversion to an alternate airport or for reinitiating the instrument approach, as circumstances dictate. This required equipment also includes any flight instruments and navigation equipment necessary to define the courses or flightpaths to be flown and to determine the significant geographic points defined by the procedure (such as transition or stepdown fixes, arrival at minimums and/or MAPs). Obviously, the flight instruments and navigation equipment must provide usable information to the pilot flying the aircraft. This information must be located within that pilot's normal instrument scan pattern. Most CAT I operations do not require redundant flight instruments and navigation equipment to execute an instrument approach procedure. For example, a single serviceable VOR/ILS system, a single marker beacon system, a single DME system, and a single set of flight instruments are normally sufficient to fly an ILS/DME instrument approach procedure using basic air carrier minimums. This example assumes that the initial approach, missed approach, and the route of flight to the alternate airport are based on VOR or VOR/DME. Inspectors must determine that the operator's overall CAT I AWTA operations program provides the policies, procedures, training, and equipment necessary for conducting the instrument approach procedures authorized by the OpSpecs.

B. Operator Manuals. Before granting approval by issuing OpSpecs, inspectors must evaluate the ability of the operator's overall program to provide the policy guidance, methods, and procedures necessary for ensuring the safe conduct of CAT I operations using basic air carrier operating minimums. In conducting this evaluation, inspectors must consider certain factors related to the manuals. After completing this evaluation, the inspector must make a judgment concerning whether the operator's program as described in its manuals is able to meet the requirements of 14 CFR and the operations specifications. Inspectors must also make a judgment concerning the operator's ability to provide for safe, accepted operating practices and procedures. When conducting this evaluation and making an appropriate judgment, the inspector should consider the following factors:

- Criteria and procedures for determining the suitability of runways, airport facilities, services and ground-based equipment necessary for the types of aircraft used and the CAT I operation to be conducted
- Criteria and procedures for determining the airborne equipment required to be serviceable at departure
- Criteria and procedures for determining the airborne and ground-based equipment that must be serviceable before conducting CAT I operations at the destination and alternate airports
- Criteria and procedures for determining the airworthiness status of the aircraft for the operation to be conducted
- Criteria and procedures to ensure that the minimum equipment list (MEL) requirements are met for the operation being conducted
- Criteria and procedures which ensure that CAT I dispatch or flight release requirements are met
- Criteria and procedures for determining the instrument procedures and operating minimums authorized, including the equipment, training, and qualification requirements necessary for conducting the operations
- Specific and detailed operating procedures and crew duty assignments for the types of aircraft used and the instrument approach procedures authorized. (These policies and procedures must require all turbojet operations to be conducted in accordance with the "stabilized approach" concept.)
- Specific requirements and instructions concerning the operating restrictions and limitations associated with the types of aircraft and the instrument approach procedures to be used

C. The Operator's Training Program. Inspectors must evaluate training programs to determine that flightcrews receive both ground and flight training on the instrument approaches the operator is authorized to conduct. Because of procedural and design similarities, flight training on one type of instrument approach procedure often provides the necessary training for other types of instrument approach procedures. Inspectors observing training in progress should verify that the approved training and qualification curriculum segments ensure flightcrew competency in the conduct of authorized instrument approach procedures.

(1) Nonprecision Approaches. Nonprecision approaches are also referred to as approaches "other than instrument landing system (ILS), microwave landing system (MLS), and global navigation satellite system landing system (GLS)." The flightcrew qualification program of each certificate holder or operator, as applicable, must address nonprecision approaches for authorization to conduct IFR operations. Ground and flight training as well as flight checking requirements must be met in accordance with the applicable operating regulation of the certificate holder or operator.

(a) Ground training and flight training on nonprecision approaches are required for certificate holders authorized to conduct IFR operations. For part 121 operations, flightcrew ground training, flight training, and flight checking must be addressed in accordance with part 121, Appendices E and F, or the Advanced Qualification Program (AQP), as applicable.

(b) Flight training on VOR approaches satisfies flight training requirements for ILS Localizer (LOC), Simplified Directional Facility (SDF), and Localizer Descent Aid (LDA) approaches.

(c) Flight training on VOR/DME approaches satisfies flight training requirements for LOC/DME and LDA/DME approaches.

(d) Flight training on LOC back course approaches is required if the LOC back course approach is authorized.

(e) GPS instrument approaches may be credited during flight checking for other equivalent types of required nonprecision approaches. However, the demonstration of any other nonprecision approaches may not be credited toward the authorization requirement to demonstrate at least one nonprecision approach utilizing GPS during the instrument check required by § 135.297 and the proficiency check required by § 121.441(a)(1).

(2) Precision-Like Approaches. Precision-like instrument approach procedures are those approaches providing vertical guidance that are other than ILS, MLS, and GLS.

(a) These are technically nonprecision approaches but are called precision-like approaches because

they provide vertical guidance. They are not precision approaches in the strict sense because they may lack the accuracy of precision approaches.

(b) Because they provide vertical guidance, precision-like approaches are to be trained using an approved method that allows descent to a published decision altitude (DA). See Order8400.10, volume 4, chapter 2, section 4, paragraph551, subparagraph E(1) for additional guidance.

(3) Precision Approaches. These approaches are those with an electronic glide slope and are referred to as ILS, MLS, and GLS approach procedures.

(a) Ground and flight training on precision approaches (ILS, MLS, and GLS approaches) is required for operators authorized to conduct precision approaches.

(b) Flight training is required on ILS approaches.

(c) Flight training on Precision Approach Radar (PAR) approaches is required, if the PAR approach is authorized.

(d) Flight training is required on MLS approaches, if the MLS approach is authorized.

(4) Circling Approach Maneuvers (authorized in OpSpec C075).

(a) See volume 3, chapter 1, section 5, part C, OpSpec C075 – Category I IFR Landing Minimums – Circle-To-Land Maneuver, for details on the training and checking requirements for the circling approach maneuver authorization for all certificate holders.

(b) No part 135 certificate holder authorized to conduct operations under IFR shall use, nor may any PIC execute a circling approach maneuver to minimums published in the instrument approach procedure for the circling approach maneuver or the minimums specified in the chart in OpSpec C075, whichever is higher - unless that PIC has, within the last 6 months, or as required by an AQP, satisfactorily demonstrated the circling approach maneuver to published minimums to an approved check airman or the Administrator.

(c) For part 121, if the operator does not provide flight training and flight checking on the circling approach maneuver in accordance with 14 CFR part 121, Appendices E and F, respectively, then the operator's General Operations Manual (GOM) and the manuals used by the flightcrews must specifically prohibit conducting circling approach maneuvers when reported weather conditions are below 1000-3 (ceiling and visibility).

(d) Ground training must include instruction on procedures to be used to ensure that missed approaches executed during a circling approach maneuver will be conducted safely.

(5) Visual Approaches. Ground training must include instruction on the requirements specified in the OpSpecs for acceptance of visual approaches.

(6) Contact Approaches may be authorized by the issuance of OpSpec C076. If the certificate holder does not provide flightcrew training in accordance with OpSpec C076, then the approved operating manuals used by the certificate holder's flightcrews should explicitly prohibit the Contact Approach.

(a) Ground Training. OpSpec C076 specifies that each PIC must satisfactorily complete approved ground training before conducting a Contact Approach. That training should include the specific conditions shown in OpSpec C076 under which the PIC may request and conduct a Contact Approach.

(b) Flight Training. Inspectors should encourage realistic flight training on the Contact Approach, as that term is described in the Aeronautical Information Manual. However, if realistic flight training is not possible, inspectors should not require flight training because of possible negative training effects.

(7) *Required and recommended training for ILS/ Precision Runway Monitor (PRM) and LDA/PRM approaches.* Required training must be included in an air carrier's training program and approved by the FAA before the FAA may authorize either or both PRM approaches in OpSpec paragraph C052. Flightcrews must accomplish required ground training before conducting ILS/PRM or LDA/PRM approaches.

(a) *Initial ground training -- REQUIRED.* This training must include all elements of the "ATTENTION TO ALL USERS" page of an ILS/PRM or an LDA/PRM as authorized, along with viewing the latest version of the PRM video. (See video at: www.faa.gov/avr/afs/prmtraining/, or contact FAA Flight Standards at (202) 267-8166 for the most current version).

NOTE: Flightcrews trained previously in PRM operations under earlier guidance are not required to re-qualify with each new version of the PRM video.

The ground portion of the training program must support the following knowledge objectives. Each flight crewmember must:

- Describe the PRM system to include the meaning of "no transgression zones."
- Know that an airplane on an adjacent approach path may be less than 4,300 feet away and may be flying at a different speed.
- Know that the automatic terminal information service (ATIS) broadcasts a pilot advisory when

ILS/PRM or LDA/PRM approaches are in progress.

- Identify the differences between ILS/PRM approach charts and normal ILS approach charts, including the special instruction pages for ILS/PRM.
- Explain the unique communication requirements (equipment and procedures) for ILS/PRM and LDA/PRM approaches.
- Know that an unpublished missed approach instruction that may be issued by ATC prior to published missed approach point is called a "breakout."
- Know that a breakout may include instructions to descend and that the descent will be to no lower than the minimum vector (MVA) altitude for the sector. The MVA guarantees 1,000 feet above the highest obstruction in that sector. The rate of descent expected by controllers is not more than 1,000 feet per minute.
- Know that a pilot must initiate a breakout maneuver manually and immediately upon hearing the "Traffic Alert" command from ATC, and that adequate separation requires that the pilot establish a 3-degree-per-second rate of turn within 8 seconds.
- Know that the three areas (ATIS, Dual VHF Comm. Required, and All "Breakouts") in the "ATTENTION TO ALL USERS PAGE" must be briefed (in flight) prior to conducting an ILS/PRM or an LDA/PRM approach.
- Know that TCAS may be operated in the TA/RA mode when conducting PRM approaches, including the following points:
  - When an RA occurs with a concurrent ATC breakout command – follow the turn required in the ATC instructions; follow the climb or descent in the RA command. (split commands)
  - When an RA occurs without a concurrent ATC breakout command – follow the RA and contact ATC as soon as practical
  - TCAS provides only vertical resolution to aircraft conflicts
  - An operative TCAS is not required for PRM operations
- Know procedures for simultaneous offset instrument approaches (SOIA), including the following points:
  - A visual segment of the LDA/PRM approach is established prior to the LDA missed approach point (MAP) to permit:
    - Visual acquisition of the ILS traffic to the parallel runway and advising ATC
    - Visual acquisition of the runway environment
  - LDA course is maintained until the MAP. At the MAP, the pilot must have the ILS traffic in sight and the runway environment in sight, or fly the missed approach.
  - At the MAP with the ILS traffic and the runway in sight, the pilot may continue to a landing:
    - Maneuver to align with the runway centerline
    - Stabilize on glide path no lower than 500 feet above TDZ
    - Avoid wake turbulence from the ILS traffic

NOTE: Testing of these knowledge objectives is recommended.

(b) Initial flight training.

REQUIRED:

- Breakout maneuver

NOTE 1:Initial breakout flight training must focus on the descending breakout.

NOTE 2:Air carriers who currently hold OpSpec approval to conduct PRM approaches have 12 months from the date of this bulletin to initiate breakout flight training, and must complete training by the end of the next full training cycle.

NOTE 3:Air carriers applying for initial approval to conduct PRM approaches must complete breakout flight training by the end of the next full training cycle after receiving OpSpec approval.

NOTE 4:Air carriers may be authorized to conduct ILS/PRM approaches, LDA/PRM approaches, or both. Duplicative flight training in the breakout maneuver is not required (i.e, breakout covered in flight training for ILS/PRM is creditable toward the LDA/PRM, and vice versa).

NOTE 5:All air carriers who provide breakout training to flightcrews prior to the date of this bulletin are not required to requalify.

- LDA/PRM approach

RECOMMENDED:

- ILS/PRM approach (if authorized on OpSpecs)

(c) Recurrent ground training.

REQUIRED:

- Review of the ground training elements and the video in (a) above

RECOMMENDED:

- Testing in those elements

(d) Recurrent flight training.

REQUIRED: None.

RECOMMENDED:

- ILS/PRM approach
- LDA/PRM approach
- Breakout

(8) *Authorizing ILS/PRM approaches and LDA/PRM approaches for 14 CFR part 129 foreign air carriers.* A part 129 foreign air carrier operating in the United States may be authorized in OpSpec C052 to conduct ILS/PRM approaches and/or LDA/PRM approaches if:

- That air carrier meets the ground and flight training requirements contained in paragraphs (7)(a) through (c) above;
- The CAA for the foreign air carrier authorizes these approaches; and
- The air carrier's POI determines the following:
  - That a point of contact for the foreign air carrier's Civil Aviation Authority (CAA) has been established in the foreign air carrier's OpSpec A006(c), issued by the appropriate International Field Office (IFO) or Flight Standards District Office (FSDO), and
  - That the IFO/FSDO has notified the International Programs and Policy office, AFS-50, that the foreign air carrier is authorized to conduct PRM approaches.

NOTE: AFS-50 must notify FAA Air Traffic Procedures, ATP-100, of each foreign air carrier authorized to conduct PRM approaches.

(9) *Documents that must be updated prior to ILS/PRM and/or LDA/PRM approach authorization (U.S. Carriers).* The following documents must be updated to include appropriate content before the POI may authorize either type of PRM approach in OpSpec C052:

- The flight operations manual (FOM) used by the air carrier's flightcrews must address the ILS/PRM approach and/or the LDA/PRM approach, as applicable, and related procedures, including breakout. The FAA must approve those procedures. Air carriers must provide flightcrews immediate notice of the approved procedures. The FOM must be changed within 12 months from the date of this bulletin.
- The air carrier's training program must be modified to include the information in the FOM, the initial training program requirements contained in paragraphs (7)(a) and (b) above, and the recurrent training requirements contained in (7)(c) above, as approved by the FAA.

D. Maintenance Program. The airworthiness program for each of the operator's aircraft types and for avionics equipment must be structured to equip, configure, and maintain the operator's aircraft and systems to support CAT I AWTA operations. POIs must coordinate closely with the principal maintenance and avionics inspectors to ensure that the operator's aircraft are airworthy for the CAT I operations to be conducted.

E. Proving and Validation Tests. Since CAT I AWTA operations using basic air carrier operating minimums are the foundation or basic "building block" for IFR operations, additional validation testing above the normal aircraft proving test requirements is usually not necessary or appropriate. Validation testing is not required if CAT I operations are evaluated during the aircraft proving tests required by part 121 or part 135. Validation tests are required, however, if an operator has previously conducted "VFR Only" operations and is proposing to conduct CAT I AWTA operations for the first time with existing aircraft. Validation tests may also be required when a part 135 operator or an applicant for a certificate proposes to conduct CAT I operations with an aircraft in which part 135 does not require that a proving test be conducted.

F. Higher Headquarters' Review and Concurrence. Higher headquarters' review and concurrence is generally not required for approval of CAT I AWTA operations using basic air carrier operating minimums. The exception, however, is when a special review and concurrence requirement has been established by the regional flight standards division and/or AFS-400.

557. CAT I OPERATIONS USING STANDARD AIR CARRIER OPERATING MINIMUMS. CAT I AWTA operations using standard operating minimums are conceptually based on the foundation or building block experience gained through the use of basic air carrier operating minimums. The lower operating minimums are achieved by increasing the precision of flightpath control through enhanced ground-based electronic equipment, visual aids, airborne equipment, flightcrew training and qualification, and maintenance requirements. This paragraph addresses

only those factors unique to the standard operating minimums. It is important to understand that this reduction of operating minimums only affects VIS/RVV/RVR requirements for straight-in instrument approach procedures. Minimum IFR altitudes or heights are not reduced. When inspectors evaluate a request from an operator or an applicant to conduct CAT I operations using standard operating minimums, the following factors must be considered (these are in addition to the factors discussed in paragraph 555 relating to basic air carrier operating minimums):

A. Ground-Based Visual Aids. A primary factor in achieving the lowest operating minimums is related to ground-based lighting aids. All CAT I nonprecision approach minimums below one statute mile or RVR 5000 (RVR 2000 for helicopters) and all precision approach minima below 3/4 statute mile or RVR 4000 (RVR 3500 for helicopters) are based on serviceable approach lighting systems. All precision approach minimums below 1/2 statute mile or RVR 2400 are based on serviceable approach, high intensity runway edge, high intensity touchdown zone, and high intensity runway centerline lighting. Both part 97 and the applicable operations specifications establish the lowest operating minimums which can be authorized for the various lighting configurations.

B. Ground-Based Electronic Aids. The precision of the electronic guidance system heavily influences the lowest minimums authorized for a particular instrument approach procedure. For nonprecision approaches, the precision of VOR systems allows for lower minimums than NDB systems. Standard precision approach standard operating minimums can only be achieved when the ILS provides acceptable glidepath angles, threshold crossing heights, and acceptable course and glideslope guidance, down to an HAT of 200 feet.

C. Obstacle Clearance Limitations. Standard operating minimums can only be achieved in those cases where obstacle clearance requirements permit the standard DH or MDA. In other words, higher than standard operating minimums must be established when DH or MDA adjustments are necessary due to obstacle clearance requirements.

D. Reciprocating and Turbopropeller-Powered Airplanes and All Helicopters. If an inspector is authorized to use the basic air carrier operating minimums, and uses reciprocating or turbopropeller-powered airplanes or helicopters in CAT I AWTA operations, use of the standard operating minimums is automatically authorized. This automatic authorization applies only to pilots who are not restricted by the high-minimum PIC requirements of 14 CFR and operations specifications. There are usually no additional airborne equipment or training requirements other than those specified in paragraph 555.

559. USE OF STANDARD OPERATING MINIMUMS IN TURBOJET, TURBOFAN, AND PROPFAN AIRPLANES. An operator shall not be authorized to conduct CAT I operations using standard operating minimums with turbojet, turbofan, and/or propfan airplanes unless the aircraft, airport, runway, and flightcrews used are specifically qualified for the standard operating minimums. When evaluating a proposal to conduct CAT I operations using standard operating minimums, inspectors must consider the factors discussed in this paragraph and in paragraphs 555 and 557. Based on the results of the evaluation of these factors, an inspector must make a judgment concerning the certificate holder's competence to conduct operations using the lower standard operating minimums. The criteria to be used in making this judgment includes the criteria for use of basic air carrier operating minimums and the additional criteria discussed in this paragraph and AC 120-29 (as amended). Before authorizing a certificate holder to conduct operations using standard operating minimums with any turbojet, turbofan, or propfan airplane, inspectors must determine that the overall CAT I AWTA program (including manuals and training) ensures the following criteria will be met during the conduct of those operations:

A. Airports and Runways. Operations must be restricted to those airports and runways where an authorized instrument approach procedure is established in accordance with part 97 or the OpSpecs and where the authorized instrument approach procedure permits the use of standard operating minimums. The airport facilities and services must meet the following additional criteria when standard operating minimums are used (see paragraph 553):

- Runways being used provide an effective runway field length of at least 1.15 times the landing field length required by § 121.195(b) or § 135.385(b)
- Runways are equipped with serviceable approach and runway lighting systems as required by the OpSpecs
- NAVAIDs serving the runways and the obstacle clearance requirements for the runways permit the development of an unrestricted instrument approach procedure (that is, a standard DH or MDA)
- ATC facilities and services are compatible with the use of standard operating minimums
- The weather reporting system must support operations using standard operating minimums (RVR is required for operations below 1/2 statute mile)

B. Additional Airborne Equipment. Additional airborne equipment is not usually required for nonprecision instrument approaches when standard operating minimums are used. Additional airborne equipment, however, is required before standard operating minimums can be used for precision approaches.

(1) Flight Guidance and Automatic Control

Systems. The minimum additional airborne equipment required is either a single flight director or a single automatic approach coupler (autopilot). However, it is usually advantageous to install redundant equipment because the airborne equipment used, the flight training conducted, and the dispatch or flight release requirements are inter-related, especially when the probability of inflight failure is considered. As a result many operators use either dual flight directors with dual displays or a single flight director and a single approach coupler. See the discussion on training and dispatch or flight release requirements in the following paragraph.

(2) Instrument Failure Detection and Warning System. Unless the operator implements acceptable procedures and crew duty assignments to reliably and immediately detect failures/malfunctions, the aircraft should be equipped with an acceptable instrument failure and/or malfunction detection and warning system to provide immediate and accurate information to pilots of any failures in essential equipment. If such detection and warning systems are not installed, the certificate holder must implement acceptable procedures and crew duty assignments to reliably and immediately detect failures or malfunctions which could affect flight safety.

(3) Any additional equipment specified in the type design approval (certification) basis and/or the FAA-approved flight manual must also be installed and serviceable if it is required for operations using standard operating minimums.

C. Pilot Training. The operator's approved training program, ground and flight, must provide the flightcrews with the skills, knowledge, and proficiency necessary to safely conduct operations using standard operating minimums. Use of the "stabilized approach" is mandatory for all turbojet operations. Training on the use of standard operating minimums for nonprecision approaches can usually be adequately addressed in ground training, since additional airborne equipment is not usually required for nonprecision approaches. Ground training on use of standard minimums during nonprecision approaches should address the required ground-based visual aids (lighting and marking), and the authorized procedures and operating minimums. The ground training should also address any additional required procedures and crew duties, and the increased difficulty encountered during the transition from instrument to external visual references created by the reduced seeing-conditions associated with use of standard operating minimums. Training on the use of standard operating minimums for precision approaches must be more extensive and involve both ground and flight training curriculum segments.

(1) Ground Training for Precision Approaches. The ground training curriculum segments for all categories of training must include instruction on the following factors as they relate to the use of standard operating minimums during precision approaches:

- Required ground-based visual aids
- Authorized instrument approach procedures, and operating minimums
- Additional required procedures and crew duties
- Seeing-conditions associated with the transition from instrument to visual flight
- The necessity for maintaining a full-time instrument reference by one pilot until passing 100 feet AGL
- Required additional airborne equipment
- Critical reasons for proper "eye reference" position (proper sitting height)
- Required pilot training and qualifications
- Methods for determining that the airplane is airworthy for operations using standard operating minimums, and the associated dispatch or flight release requirements

(2) Flight Training for Precision Approach. The primary objective of flight training on the use of standard operating minimums is to ensure that the flightcrew has the skills, knowledge, and proficiency necessary for meeting the operational concepts and criteria of operations using the lower minimums. In addition, pilots must be specifically qualified to conduct precision approaches using the standard operating minimums. In order to qualify, pilots must satisfactorily demonstrate to a check airman or an FAA inspector, either inflight or in an acceptable simulator, the competence necessary to safely conduct these operations. The maneuvers on which pilots must be trained and checked depends on the equipment installed and the dispatch (or flight release) option selected by the operator. The appropriate maneuvers for each equipment installation and dispatch (or flight release) option are described in the following subparagraphs. The maneuvers must be accomplished in accordance with the policies, standards, procedures, and crew duties specified in the operator's manuals and approved training program. When the maneuvers are performed in a flight simulator which realistically reproduces the seeing-conditions encountered and the required ground-based visual aids, the transition from instrument to visual reference should begin at 200 feet as it would normally occur in actual operations. However, when these maneuvers are accomplished in an airplane, the maneuvers (except for "raw data" approaches) must be conducted "under the hood" down to 100 feet. This lower height during training or checking in the actual airplane is necessary to realistically simulate the difficulties encountered during the transition from instrument to visual reference at 200 feet in actual weather conditions even though the flight check is administered in much better seeing-conditions.

(a) For operations based on dual independent flight directors with dual displays, pilots must be trained and demonstrate competence on at least the following maneuvers: ILS/MLS approach flown to 200 feet (100 feet in an airplane), using the flight director system followed by a transition from instrument flight to visual flight to complete a landing; and an ILS/MLS approach flown to 200 feet (100 feet in an airplane) using the flight director system, with or without a transition to visual flight, followed by a missed approach conducted by reference to instruments.

(b) For operations based on a single flight director system with dual displays and on an automatic approach coupler (autopilot), pilots must be trained in and demonstrate competence on at least the following maneuvers: an ILS/MLS approach flown to 200 feet (100 feet in an airplane) using the flight director system; and an ILS/MLS approach flown to 200 feet (100 feet in an airplane) using the automatic approach coupler (autopilot). One of the approaches must be followed by a transition from instrument flight to visual flight to complete a landing while the other must be followed, with or without a transition to visual flight, by a missed approach conducted by reference to instruments.

(c) For operations based on a single flight director system or a single approach coupler (autopilot), pilots must be trained in and demonstrate competence in at least the following maneuvers: an ILS/MLS approach using only "raw data" flown to 200 feet (200 feet in an airplane); an ILS/MLS approach flown to 200 feet (100 feet in an airplane) using either the flight director or the autopilot, as appropriate. One of the approaches must be followed by a transition from instrument flight to visual flight to complete a landing, while the other must be followed, with or without a transition to visual flight, by a missed approach conducted by reference to instruments.

(d) For operators authorized to conduct PAR approaches, pilots must also be trained in and demonstrate competence in the PAR approach. Approaches using PAR procedures must be flown to 200 feet (100 feet in an airplane). The PAR approaches may be followed by either transition to visual flight to complete a landing or a missed approach conducted by reference to instruments.

D. Operations Manuals and Flightcrew Duties. The operator's manuals must provide clear policies, procedures, and the direction and guidance necessary to ensure the safe conduct of those operations using lower than the standard operating minimums. The manual material must address and meet the criteria specified by 14 CFR, this handbook, and any appropriate advisory circulars. The manuals must adequately address the items discussed in paragraph 555B, as those items relate to the conduct of CAT I operations using standard operating minimums with turbojet, turbofan, or propfan airplanes.

E. Maintenance Program. Before approving an operator's proposal to use turbojet, turbofan, and/or propfan airplanes in CAT I operations that use standard operating minimums, inspectors must ensure that the operator's approved airworthiness program includes the special airborne equipment required for the standard minimums. Close coordination with the principal maintenance inspector(PMI) and the principal avionics inspector (PAI) is essential before granting operational approval.

F. Proving/Validation Tests. The special requirements of operations with standard operating minimums dictate that an operator validate its competency to safely conduct these operations. Since additional airborne equipment or special procedures are not required for reciprocating/turbopropeller-powered airplanes and all helicopters, validation tests of those operations are a normal part of the proving test necessary for introducing these aircraft into revenue service. The validation test for turbojet, turbofan, and propfan airplanes can also be conducted as an integral part of the initial proving tests. Such validation testing is appropriate even though the high-minimum PIC requirements initially prohibit pilots from using the standard operating minimums. Additional validation testing is necessary in situations where the operator's competence to safely conduct CAT I operations using standard operating minimums was not demonstrated before introducing an aircraft into revenue service. One example would be when required airborne equipment is added at a later date.

G. Higher Headquarters' Review and Concurrence. AFS-400 review and concurrence is usually not required before approval of standard operating minimums. Regional flight standards division review and concurrence, however, is required before approval of a particular operator's proposal to conduct initial turbojet operations with standard minimums. Unless otherwise directed, higher headquarter's review and concurrence is not required for all other operations using standard minimums.

561. SPECIAL CAT I OPERATIONS. Special CAT I AWTA operations, by definition, require the use of airborne and/or ground-based or space-based equipment over and above the minimum equipment necessary to operate in the U.S. national airspace. Special CAT I operations usually also require special knowledge, skills, proficiency, and procedures. As a result, changes and amendments to the operator's overall CAT I AWTA operations program are usually necessary to ensure safe conduct of these operations. There is additional criteria which must be incorporated into an operator's program for special CAT I operations. Special CAT I operations currently involve the use of VOR/DME-based RNAV or DME/DME-based RNAV, LORAN C, and ARA/OSAP/HEDA instrument approaches, or any landing operation using autoland or heads-up display (HUD) systems. In general, special CAT I operations require changes to an operator's operational policy, guidance, procedures, flightcrew training, and qualification and maintenance programs.

These operations are based on the use of airborne systems which have been certificated (type design approved) or otherwise shown to be airworthy for the proposed operation with an acceptable demonstration of ability and capability by the operator.

A. Autoland or Heads-Up Display (HUD) Systems. Before issuing authorization to use autoland or HUD systems in any operation, the inspector must determine that the operator's overall program will ensure that the equipment is properly installed and properly maintained for approach and landing operations. The operator's manuals and training programs must be evaluated to determine that they provide sufficient policy, guidance, operational procedures, and the training and checking necessary for the safe conduct of autoland or HUD operations. Inspectors must determine that these operations will be conducted in accordance with any necessary operational restrictions or limitations, applicable regulations, the standard OpSpecs, and accepted safe operating practices. Approval is granted by the issuance of OpSpecs C061, C062, H110, or H111 as applicable.

B. VOR/DME and DME/DME-Based RNAV Systems. Before issuing authorization to conduct instrument approach procedures with RNAV systems, inspectors must determine that the operator's overall CAT I operations program will ensure that the operation can be conducted safely. Inspectors must also determine that the following additional criteria will be met:

(1) Required Airborne Equipment. The installed RNAV system must be approved in accordance with Advisory Circular (AC) 90-45A, Approval of Area Navigation Systems for Use in the U.S. National Airspace System, (or equivalent criteria) for CAT I approach and landing operations. This approval must be valid for the areas, airports, and runways where the use of the system is proposed and any other equipment required must be serviceable.

(2) Authorized Instrument Approach Procedures and Operating Minimums. The use of the RNAV system must be restricted to those instrument approach procedures and operating minimums where the system can perform its intended function. The instrument approach procedures used must be authorized in accordance with the operations specifications. In general, VOR/DME-based RNAV and DME/DME-based RNAV systems can be used to conduct any VOR/DME-based RNAV and DME/DME-based RNAV instrument approach procedure established in part 97. Other special RNAV instrument approach procedures can be authorized by listing them in OpSpecs C064 or H112. During the initial six months of operation with a particular aircraft and RNAV system combination, the authorized CAT I minimums must be increased by adding 200 feet to the HAT/HAA and 1/2 statute mile (RVR 2400) to the VIS/RVR.

(3) Operations Manuals and Training. The operator's manuals and training programs must provide sufficient policy guidance on the use of authorized instrument approach procedures and operating minimums. The manuals must include the specific airborne and ground-based equipment required for the RNAV approaches and the means for determining the airworthiness status of the required equipment, including any MEL provisions. The manuals must include the specific flightcrew procedures to be used and any additional dispatch (flight release) restrictions or limitations which must be met. The training and qualification program must ensure that flightcrews acquire any special knowledge, skills, and proficiency necessary for the conduct of RNAV instrument approach operations. If the flight guidance information is presented on a map display, without a simultaneous display of raw data information, the pilot-not-flying (PNF) must select and display raw data information from the primary NAVAIDs of the approach being flown.

(4) Maintenance Program. The airworthiness program must ensure that the required equipment is properly installed and maintained and continually adheres to the required system performance and configuration standards.

(5) Validation Test. Validation tests are required for initial operations with a particular type of RNAV system unless the use of this system was adequately demonstrated during the proving tests associated with the introduction of an aircraft into revenue service by the operator.

(6) Higher Headquarters' Review. Initial authorization for an operator to use a particular type of RNAV equipment requires regional flight standards review and concurrence. AFS-400 review and concurrence is not required unless it is specifically requested.

C. Loran-C. The use of Loran-C instrument approaches is not yet operationally mature enough to establish definitive approval standards. When the necessary level of experience is obtained, formal approval standards will be established. During the interim period, any requests for approval to use Loran-C instrument approach procedures must be reviewed and concurred with by AFS-400. AFS-400 will provide the current national policy, criteria, and guidance for authorizing Loran-C nonprecision approaches.

D. ARAs/OSAPs/HEDAs. All helicopter operations using ARAs, OSAPs, or HEDAs must be approved in accordance with AC 90-80 (as amended).

E. IFR Approaches in Uncontrolled Airspace. The operator can be authorized to conduct CAT I AWTA operations in uncontrolled airspace if the requirements of the OpSpecs are met.

(1) Non-Scheduled Operations. For non-scheduled operations, the inspector must ensure that the operator's CAT I operations program provides the policy, direction, and guidance necessary to safely conduct these operations. Inspectors must also ensure that the certificate holder's

manuals cover the specific procedures which must be used, and the facilities and services which must be available and operational for the safe conduct of instrument approach operations in uncontrolled airspace.

(2) Scheduled Operations. In addition to meeting the requirements for non-scheduled operations, the inspectors must ensure that the facilities and services necessary for the safe conduct of instrument approach procedures in uncontrolled airspace during a scheduled operation are specified in the OpSpecs.

(3) Method of Approval. The authorizations to conduct instrument approach procedures in uncontrolled airspace are granted by issuing OpSpecs C064 or H113.

563. APPROVAL OF CAT I ALL-WEATHER OPERATIONS. CAT I AWTA operations approvals are granted by issuance of, or amendments to, the OpSpecs. The authorizations, limitations, and provisions applicable to CAT I operations are specified in Part C of the OpSpecs (see C051, C052, C053, and C054). OpSpecs authorizing reciprocating and turbopropeller-powered airplane CAT I operations that use ICAO standard NAVAIDs and ASRs and PARs may be approved by certificate holding district offices without higher headquarters' review and concurrence, if the applicable conditions of this handbook are met. All turbojet, turbofan, and propfan operations authorized to use the standard operating minimums and all RNAV instrument approach operations are required to have regional flight standards division review and concurrence before approval. All operations using NAVAIDs which are not ICAO-standard NAVAIDs (such as Loran-C, GPS, ARA, and OSAP) are required to have both regional flight standards division and AFS-400 review and concurrence before approval.

564. - 580. RESERVED.

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