

AW/OPS 1.1.053	 CAA	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

1. Objective

- 1.1. This section contains concepts, direction, and guidance to be used by inspectors for evaluating and approving or denying requests for authorization to conduct Category (CAT) III all-weather terminal area (AWTA) operations.
- 1.2. All CAT III operations using aircraft, airborne equipment, ground-based equipment, or, concepts or procedures which are new to a particular operator require approval. This directive contains an amplification of the general concepts, policies, direction, and guidance covered in previous sections of this chapter. Specific standards are provided for inspectors evaluating CAT III operations with airborne and ground based equipment, which have well understood operational characteristics and limitations.
- 1.3. This is a common directive for Airworthiness and Operations.
 - 1.3.1. Close coordination between AW and OPS inspectors executing this directive is required.
 - 1.3.2. The OI will be the lead inspector in executing this directive.
 - 1.3.3. Any amendments to this directive must be made to both AW Inspector Handbook and OPS Inspector Handbook.

2. General

2.1. Regulatory Requirements.

- 2.1.1. ANR.Ops 115A,
- 2.1.2. ANR.Ops 115B (not applicable for Chap. 13 operators),
- 2.1.3. ANR.Ops 115C,
- 2.1.4. ANR.Ops Att 4 Sec 2(a)(i)(dd)(ee)

2.2. CAT III AWTA Operations.

CAT III operations are defined, for purposes of this handbook, as all approach and landing operations conducted in instrument meteorological conditions using CAT III approach procedures to CAT III operating minima. CAT III operating minima are those minima, that specify a decision height (DH) lower than 100 feet (30 meters) above the touchdown zone and a controlling runway visual range (RVR) below RVR 1200 (350 meters). CAT III operating minima also include those operations conducted with an alert height (AH) of 100 feet (30 meters) or less above the

AW/OPS 1.1.053	 CAA	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

touchdown zone (no DH) and a controlling RVR below RVR 1200 (350 meters).

2.3. Types of CAT III Operations.

Currently (late nineties) only CAT III operations that authorized for ISRAELI operators are instrument landing system (ILS) based. The flight control laws (computer logic) used in many CAT III flight guidance and control systems (for example, auto land systems) require that a final approach segment of at least this length to perform their intended function in CAT III operation.

2.4. Kinds of CAT III Operations.

There are two different and distinct kinds of CAT III operations. These kinds of operations are fail passive operations and fail operational operations. Fail passive operations are restricted to CAT IIIa weather conditions (DH 50/RVR 700 (200 M)/200m). Fail operational operations can be conducted in either CAT IIIa or CAT IIIb weather conditions. Currently Israeli operators authorized for CAT IIIa only.

2.5. Objective of CAT III Operations.

The essential difference between CAT III operations and CAT I and CAT II operations is that a CAT III operation places a greater reliance on the guidance provided by the airborne and ground based guidance equipment. The guidance provided by the equipment must continue through touchdown in CAT IIIa operations and through touchdown and rollout to a safe taxi speed in CAT IIIb operations. In contrast to other types of operations, CAT III operations do not ensure sufficient external visual cues for the pilot to manually control the aircraft during flare and landing. The primary objective of CAT III operations is to provide a level of safety equivalent to CAT I and CAT II operations without the use of these visual cues. To meet this objective, the instrument approach procedure must provide for a safe and orderly transition from the en route phase of flight to a landing or to a missed approach (which could include a momentary touchdown during the go-around maneuver), and then a transition back to the en route environment for diversion to an alternate airport. CAT III instrument approach procedures and air traffic control (ATC) procedures must also include adequate protection from obstacles (mobile or fixed) near the landing surface to ensure that a go-around can be safely initiated from any point in the approach and landing before touchdown. The desired level of safety for CAT III operations is achieved by the following enhancements:

- 2.5.1. The airborne equipment and ground based equipment must ensure increased precision in flightpath control. The increased reliability and precision of flightpath control (as

AW/OPS 1.1.053		OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

compared to CAT I and CAT II systems) is achieved through highly reliable and precise ground based equipment and airborne systems. These systems are capable of guiding the aircraft with significantly increased precision to touchdown or through rollout, as appropriate.

- 2.5.2. Special flightcrew qualification and training are also required to ensure that the aircraft is operated with the required degree of precision during these operations.
- 2.5.3. The aircraft performance and equipment requirements associated with a missed approach from very low altitudes are enhanced to ensure that these operations can be safely conducted even if a momentary touchdown occurs on the runway after the go-around is initiated.
- 2.5.4. Additional visual aids are required to enhance seeing-conditions during the final stages of landing, flare, rollout, and taxi operations.
- 2.5.5. Special criteria are established to provide additional obstacle and terrain clearance to accommodate missed approaches from very low altitudes, which may include a momentary touchdown on the runway after the go-around is initiated.
- 2.5.6. Special requirements are established to provide enhanced protection for the ILS/MLS signals during the final stages of landing, flare, and rollout to ensure that these signals are not disturbed during these critical phases of flight.
- 2.5.7. More stringent criteria are specified for the profile of the prethreshold terrain to ensure that the flight guidance and control systems function properly during the final stages of approach, flare, and landing.
- 2.5.8. Special operational and ATC procedures and/or limitations are established to ensure the overall safety and efficiency of the operation.

3. Reference Material, Forms & Job-Aids

3.1. Reference Material

- 3.1.1. AP 1.1.053
- 3.1.2. FAA [AC 120-28](#)

4. Process

AW/OPS 1.1.053	 CAAI	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

4.1. **CAT III OPERATIONAL CONCEPTS.**

The weather and environmental conditions encountered in CAT III operations severely restrict seeing-conditions. External visual reference is not acquired until the aircraft reaches a very low altitude. Typically, external visual references begin to become available below 100 feet in CAT IIIa operations and below 50 feet in CAT IIIb operations. Even though external visual references are usually available before touchdown, the seeing-conditions are not sufficient for the pilot to consistently perform a safe manual landing. Therefore, the aircraft must be controlled by instruments and special equipment throughout the approach, flare, and touchdown (deceleration for rotorcraft) in CAT IIIa weather conditions and through rollout to a safe taxi speed (air taxi or hover for rotorcraft) in CAT IIIb weather conditions. Due to the reduced seeing-conditions and the hazards associated with a pilot's attempts to manually maneuver the aircraft to landing in those seeing-conditions, the precision of the flight guidance and control system and the overall precision of flightpath control must have certain capabilities. These capabilities include the safe delivery of the aircraft to touchdown in CAT IIIa weather conditions and through touchdown and rollout to a safe taxi speed in CAT IIIb conditions.

4.1.1. **Decision Height (DH) and Alert Height (AH).**

All CAT IIIa fail passive operations are conducted in accordance with the DH and RVR concepts. All CAT IIIa and CAT IIIb fail operational operations are normally conducted in accordance with the AH and RVR concepts. Decision heights are only used with fail operational systems in very unique situations (see FAA [AC 120-28](#)). DH and AH are *never* used together in any operation since the DH requires that external visual reference be established before passing a specified point and AH does not. The very limited seeing-conditions available in CAT III operations require additional criteria to ensure that an adequate level of safety is achieved and maintained when operating in this environment.

4.1.2. **CAT III Operating Minima.**

CAT III operating procedures and minima are established to ensure that the desired level of safety is achieved when aircraft are operated in CAT III seeing-conditions. These operating minima are based on the DH and RVR concepts for fail passive operations and the AH and RVR concepts for fail operational operations. These operating minima establish the minimum safe heights for instrument flight (DH 50 for fail passive operations and touchdown for fail operational operations) and the minimum controlling RVR necessary to safely complete the operation being conducted with a particular aircraft. These operating minima are established in

AW/OPS 1.1.053		OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

full consideration of the required CAT III operational concepts; airborne equipment; ground based, visual and electronic equipment; operating procedures; and the pilot training and qualifications required for these operations. These operating minima, when combined with other CAT III requirements, ensure that the combination of information from external visual sources and the aircraft instrument and equipment is sufficient to enable properly qualified pilots to safely operate the aircraft along the desired flightpath , touchdown, and safely rollout. As the quality and quantity of external visual information decreases due to the reduced seeing-conditions (for example, going from CAT II to CAT IIIa to CAT IIIb), the quality and quantity of instrument information, the capability of the airborne and ground based CAT III system, and the proficiency of the flightcrew must be increased to maintain the desired level of safety.

4.1.3. **Kinds of CAT III Operations.**

There are two different and distinct kinds of CAT III operations: fail passive operations and fail operational operations.

4.1.3.1 **Fail passive** operations are restricted to CAT IIIa and must use a DH of 50 feet (15 meters) and a controlling RVR of RVR 700 (200 M) (200 meters). Fail passive operations are also currently (2005) only authorized for aircraft smaller than a DC-10 or L-1011 due to approach geometry factors such as wheel to glideslope antenna height and wheel to pilot's eye height. Inspectors must require operators to conduct proof of concept testing before approving fail passive CAT III operations with a DC-10 or L-1011 or larger size aircraft. As the name implies, fail passive CAT III systems are permitted to fail below 100 feet above ground level (AGL), under certain remote circumstances, provided that the flight guidance and control system always fails passively (does not disturb the aircraft's flightpath when it fails) and the flightcrew immediately receives an aural and visual warning of system failure. Since a fail passive system is permitted to fail, a DH must be used to ensure that, before passing 50 feet AGL, the flightcrew establishes external visual reference with the touchdown zone to determine that the flight guidance and control system is functioning properly and to ensure that the aircraft is being properly delivered to the runway. Extensive research and operational experience have shown that pilots may not always have sufficient external visual cues in certain CAT III weather conditions to properly conduct this assessment before passing 50 feet AGL if the controlling RVR is less than RVR 700 (200 M). These

AW/OPS 1.1.053		OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

research programs clearly show that a go-around is mandatory if the flight guidance and control system fails before touchdown during fail passive operations in CAT III weather conditions. These research programs also clearly show that, if the system fails below 100 feet AGL, the external visual cues are not sufficient to permit the pilot to use these cues to consistently and safely manually complete the landing in certain CAT III weather conditions when the controlling RVR is less than RVR 1000. Additionally, these research programs show that all missed approaches resulting from failures in the fail passive autoland system in CAT III weather conditions should be manually flown since automatic go-around capability is also lost in most aircraft if the fail passive automatic landing system fails.

4.1.3.2 **Fail operational** operations usually use an alert height (AH) instead of a DH (see FAA [AC 120-28](#)). Fail operational landing systems can be used for CAT IIIa operations. Fail operational landing systems can also be used in CAT IIIb operations if these systems have at least a fail passive rollout control capability. As the name implies, fail operational systems remain operational even if failures occur. In other words, the loss of CAT III capability is not permitted when the aircraft is in the critical phases of approach and landing (below 100 feet AGL). Fail operational systems are designed so that the system remains fully operational following any failure or combination of failures that are likely to occur after the aircraft passes 100 feet AGL. Fail operational systems have been shown to have the capability to safely deliver the aircraft to the touchdown zone if the system is still fail operational when the aircraft passes 100 feet AGL, even if failures occur in the system after passing this height. Therefore, there is no requirement to establish external visual reference before touchdown to confirm that the aircraft will land safely. The lowest minimum that may currently be approved (2005) for any AWTA operation by a U.S. operator is a controlling RVR of RVR 300 (100 M) (90 meters). This restriction is based on the difficulties associated with aircraft movement on the taxiways, ramps, and other maneuvering areas on the airport and the on difficulties related to providing timely safety facilities and services (such as crash, fire, and rescue). In addition, fail operational landing systems and fail operational rollout control systems will be required if operating minima less than RVR 300 (100 M) is approved in the future.

4.2. ESTABLISHING CAT III OPERATING MINIMA.

AW/OPS 1.1.053	 CAAINJT1	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

4.2.1. **Operating Minima.**

The operating minima (DH and RVR or AH and RVR) for CAT III operations are usually determined by the tasks the pilot is required to perform to complete the landing and rollout (deceleration and air taxi for rotorcraft). Consideration must be given to the degree of precision and integrity in flightpath control provided by the required electronic equipment and the enhanced seeing-conditions provided by the required visual aids. The RVR minima are also higher if the pilot has to establish better seeing-conditions due to the complexity or difficulty of the tasks required to safely complete the landing (for example, factors related to the design or handling characteristics of a particular aircraft). As a general rule in CAT III operations, the minimum required seeing condition (RVR) is higher than RVR 300 (100 M) in situations where the pilot is required to perform special tasks during the operation. Some examples of these situations and special tasks are as follows:

- 4.2.1.1 The pilot must establish visual reference before touchdown to confirm that the aircraft is being properly delivered to the runway (fail passive CAT IIIa)
- 4.2.1.2 The pilot must use external visual references to manually control the rollout (some CAT IIIa aircraft)
- 4.2.1.3 Situations where the localizer (azimuth) cannot be used for rollout guidance (the course structure fails to meet CAT IIIb flight inspection criteria for rollout)
- 4.2.1.4 Situations where the pre-threshold terrain profile at a particular runway creates abnormal but otherwise safe autoland performance in certain aircraft
- 4.2.1.5 Situations where the aircraft has some other unique design feature or piloting task that requires enhanced seeing-conditions to safely perform a particular maneuver.

4.2.2. **Levels**

Three basic levels of operating minima have been established and are internationally agreed to for CAT III operations. These basic levels are: CAT IIIa (RVR 700 (200 M)), CAT IIIb (RVR 150 (50 M)), and CAT IIIc (RVR 0). Currently, the lowest CAT III minima approved for any operator are RVR 700 (200 M) (200 meters)

- 4.2.2.1 The RVR 1000 (300 m) level is normally used for initial CAT IIIa operations for an aircraft new to an operator, unless that operator has received operational credit for using the Special Process for Minima Reduction. Operators receiving this special operational credit may conduct initial CAT IIIa operations with RVR 700 (200 M) (200 m) minima.
- 4.2.2.2 The RVR 700 (200 M) level is the basic level for CAT IIIa operations. This level is the lowest minimum that can

AW/OPS 1.1.053		OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

be authorized for fail passive operations. RVR 700 (200 M) is also the lowest minimum that can be authorized for operations with fail operational landing systems, which do not have a rollout control capability. Additionally, operations at runways which have ILS localizer restrictions (such as localizer unusable for rollout) are limited to the RVR 700 (200 M) minimum.

4.2.2.3 The RVR 600 (175 M) level is the current (2005) standard level for CAT III operations. due to RVR reporting limitations, limitations to taxiway centerline lighting, and ground movement and control limitations. The RVR 600 (175 M) level is also the lowest minimum that can be authorized at any airport for fail operational landing systems, which do not have at least a fail passive rollout control system.

4.2.2.4 The RVR 300 (100 M) level is the lowest minimum that can be currently authorized for operations at any airport. This limitation is due to major limitations associated with the ground movement of aircraft and vehicles and the provision of timely crash, fire, and rescue facilities and services when operating in seeing-conditions less than those equivalent to RVR 300 (100 M) . Operations below RVR 300 (100 M) are not foreseen until all of these limitations are resolved.

4.2.2.5 RVR 150 (50 M) level operations are not foreseen in the near future. Operations at this level are not foreseen until the aircraft and essential ground vehicles can be reliably maneuvered on the airport without relying on normal external visual references (for example, forward looking infrared sensors).

4.3. FUNCTIONAL REQUIREMENTS FOR VISUAL REFERENCE.

The function of external visual reference is dependent upon the kind of CAT III operation being conducted. During operations with a DH (all fail-passive and certain unique fail-operational operations), sufficient external visual reference must be obtained to determine (before passing 50 feet AGL) that the flight control and guidance system is properly delivering the aircraft to the touchdown zone. These visual references are necessary for the pilot to determine that the aircraft is aligned with the touchdown zone and tracking so as to touchdown within the lateral confines of the runway. These visual references are also essential during operations with a DH to permit the pilot to detect situations where the aircraft would not touchdown within the longitudinal confines of the touchdown zone. For operators with an AH (fail-operational operations only), however, the external visual references that become available as the aircraft descends serve as advisory information to the pilot. During operations with an AH, the pilot is not required to establish visual reference before

AW/OPS 1.1.053	 CAA	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

touchdown. The visual references that are available to the pilot during operations with an AH are used primarily for: assessing the performance of the rollout control system; continuing the rollout manually if a fail-passive rollout control system fails; and for taxiing the aircraft once a safe taxi speed is reached.

4.4. DECISION REGION .

4.4.1. Decision Region.

The decision region must be used in all CAT III operations. The decision region is that portion of the approach between 300 feet and 100 feet where the tracking performance of the flight guidance and control system is critically evaluated by the flightcrew to determine if the overall system performance is sufficient for the aircraft to continue the approach to touchdown. Since the visual scene normally expands as the aircraft descends due to geometric and slant range effects, the pilot must integrate the instrument and airborne system information with the visual cues as they become available.

4.4.2. **DH Operations.** For operations that use a DH, the pilot must arrive at a decision before passing the DH to either permit the flight guidance and control system to be used to touchdown or to execute a missed approach. For a DH operation, the external visual information, the instrument information, and the airborne system information must be integrated in the decision region so the flightcrew can make a definitive decision no later than arrival at the DH. The decision to permit the flight guidance and control system to continue to direct the aircraft to touchdown must be based on an assessment that the airborne system is still fail passive (fail operational for CAT IIIb operations), the instrument information confirms that the tracking performance of the airborne system meets the decision region tolerances, and the external visual cues confirm that the aircraft will touchdown within the touchdown zone.

4.4.3. **AH Operations.** For operations with an AH, the pilot must also arrive at a decision, before passing the AH, to either permit the flight guidance and control system to be used to touchdown or to execute a missed approach. In direct contrast to operations with a DH, however, this decision must be based on an assessment that the airborne system is still fail operational and the instrument information confirms that the tracking performance of the airborne system meets the decision region tolerances. External visual references are not required before touchdown in operations based on the AH concept.

AW/OPS 1.1.053	 CAAINJ11	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

4.4.4. **Within the Decision Region.** Within the decision region, the flightcrew must be especially cognizant of the maximum permissible excursions of the raw ILS/MLS course and glidepath deviation from which a landing can be safely completed. The tracking performance criteria normally used for maximum displacements within the decision region are $\pm 1/3$ dot localizer (azimuth) deviation and $\pm 1/2$ dot glideslope (elevation) deviation with no sustained oscillations about the localizer (azimuth) or the glideslope (elevation). When the tracking performance is outside these parameters within the decision region during CAT III weather conditions, a go-around must be executed since the tracking performance is not sufficient to ensure that the aircraft will safely complete a landing within the touchdown zone. Also, when operating within the decision region, the flightcrew must be especially alert for sudden, rapid oscillations of the localizer or glideslope deviations since these oscillations (the windshield wiper effect) may indicate that the ILS/MLS critical areas are not adequately protected. If any such oscillations occur below 100 feet AGL, a missed approach must be immediately executed unless adequate external visual cues are available to confirm that the aircraft is being properly delivered to the runway. A missed approach also must be immediately executed at any point in the approach before touchdown if the flightcrew detects or strongly suspects abnormal airborne or ground-based system performance.

4.5. RADIO ALTIMETER AND PRETHRESHOLD TERRAIN.

4.5.1. Prethreshold Terrain.

The profile of the prethreshold terrain is important to all CAT III approach operations because the flight guidance and control systems in many aircraft use radio altimeter information to change the mode of operation and/or change the localizer or glideslope tracking sensitivity. At runways where the terrain beneath the approach flightpath is not approximately level, abnormal autopilot and/or flight director behavior may result from erroneous radio altimeter signals. Although these abnormalities may not be serious in CAT I or CAT II operations, irregularities in the prethreshold terrain can have a major effect on the performance of the flight guidance and control systems required for CAT III operations. The profile of the prethreshold terrain is also important to all CAT III approach operations which use an AH or a DH based on radar altimeter (RA) information because the terrain can affect the value used for AH or DH. In certain extreme circumstances, the prethreshold terrain profile can have such an adverse affect on determining the AH or DH from the RA,

AW/OPS 1.1.053	 CAAINJT1	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

that the use of this information must be prohibited (that is, RA not authorized).

4.5.2. Operation.

The operation of almost all CAT III landing systems is dependent on RA information during the latter stages of the landing. The flare profile, the rate of descent at touchdown, and the distance of the touchdown point from the threshold can be adversely affected by the profile of the terrain immediately before the landing threshold. The terrain, which is most critical, lies in an area approximately 200 feet on either side of the runway centerline extended from the threshold into the approach area to a distance of approximately 1000 feet before the landing threshold.

4.5.3. Prethreshold Terrain.

The prethreshold terrain can also have an effect on AH or DH since the AH or DH used in CAT III operations is normally based on radio altimeter information. The AH used in CAT III operations is either AH 100 or AH 50. The DH used in CAT III operations is either DH 50 for fail passive operations or a DH of 50 feet or less for fail operational operations. Therefore, the terrain profile within the last 3,000 feet, before the threshold, must be evaluated to establish the proper AH or DH and to ensure that the AH or DH can be accurately determined from radio altimeter information. The use of radio altimeter to determine AH or DH must be prohibited (that is, RA not authorized) in those situations where the AH or DH cannot be accurately and reliably determined from radio altimeter information.

4.5.4. Runways.

A few CAT II runways currently have restrictions (that is, RA not authorized) due to the prethreshold terrain profile, which prohibits the use of RA information to determine the CAT II DH. Standard CAT II operations (DH 100 and RVR 1200 (350 m)) can still be conducted by using the inner marker to determine arrival at the DH. Although the RA cannot be used to accurately and reliably determine arrival at the CAT II DH (HAT 100), it may still be possible to safely conduct CAT III operations to these runways if the prethreshold terrain does not adversely affect the performance of the CAT III landing system. CAT III operations may be conducted, however, to these runways when the CAT III AH or DH can be accurately and reliably determined by RA information or when an alternative means can be used to identify arrival at the AH or DH. Therefore, CAT III operations at all runways which have CAT II radio altimeter restrictions require a special evaluation to determine that the CAT III AH or DH can be accurately and

AW/OPS 1.1.053		OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

reliably established for that runway. CAT III operations shall not be approved to these runways and CAT III instrument approach procedures shall not be established for these runways until specific CAT III approval is received .

4.5.5. Inner Marker.

Since the inner marker is normally beneath the CAT II DH (HAT 100), fail operational operations which are authorized to use AH 100 can use the inner marker to define AH (in lieu of the RA) at runways where the use of RA information is not authorized. The CAT III OpSpecs must contain a specific limitation that the inner marker must be used to define AH at that runway. Furthermore, fail passive operations and those fail operational operations, which require the use of a DH cannot be conducted at such a runway unless RA information can be used to accurately and reliably define the CAT III DH being used.

4.5.6. DHs Used in CAT III.

Since all DHs used in CAT III operations must be 50 feet or less, the inner marker cannot be used to define the CAT III DH. It may be possible, however, to use RA information to accurately and reliably establish the CAT III DH even though RA information cannot be used to define the CAT II DH (HAT 100). Since DH 50 is located very near the runway threshold and a DH less than DH 50 occurs over the runway, the terrain profile within these areas is generally adequate for CAT III RA based DHs. The prethreshold terrain in unusual circumstances, however, can adversely affect the use of RA information to define a CAT III DH and CAT III operations based on a DH, and therefore must be prohibited in those cases.

4.5.7. Operating Rules.

The operating rules prohibit the use of an autopilot or a head up display (HUD) to touchdown in any operation unless the operator is specifically authorized to conduct autoland operations with that aircraft in OpSpecs . It is the operator's responsibility to determine that the prethreshold terrain profile and ILS/MLS course structures are adequate for operations at any runway where it conducts landing operations using these systems. Therefore, all operators approved to use autoland or HUD equipped aircraft should be encouraged to routinely use these systems at suitably equipped runways during operations in VFR and in CAT I instrument flight rules (IFR) conditions. They should also routinely monitor equipment performance.

4.6. TYPES OF ILS SYSTEMS.

AW/OPS 1.1.053	 CAA	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

4.6.1. **CAT III Operations.**

CAT III operations conducted by operators have been conducted on two different types of ILS systems. These two types of systems are specified as Types II and III ILS systems.

4.6.2. **ILS Systems.**

The ILS systems that were originally installed to support CAT III operations met all of the International Civil Aviation Organization (ICAO) requirements and recommendations for those ILS facilities intended to support CAT III operations. The description of these facilities is specified in ICAO Annex 10 as Facility Performance CAT III systems. The primary purpose for transitioning to a different classification terminology was to provide a clear distinction between the ILS system black box configurations, the performance of the ILS, and the kinds of operations that could be conducted on a particular kind of ILS. The type designator only specifies the black box configuration of the ILS (for example, one active localizer transmitter and one hot standby transmitter).

4.6.3. **Originally Installed ILS Systems.**

The ILS systems originally installed to support CAT II operations exceeded the ICAO requirements for Facility Performance CAT II Systems. These systems are now known as Type II, ILS systems and most of these systems are also known as AN/GRN 27 systems. The most significant differences from an operational perspective between the Type II systems and the Type III systems are related to their black box configurations. For example, although the Type II system also had redundant localizer transmitters, it used a cold standby transmitter instead of a hot standby transmitter. The use of a cold standby transmitter resulted in a short, loss of signal period when the active transmitter failed and the system automatically switched power to the cold transmitter. The Type II system also used dual far field monitors to detect localizer out of tolerance conditions instead of the triple monitors used in the Type III system.

4.6.4. **Final Steps to Fully Upgrade.**

The final steps to fully upgrade Type II facilities to full CAT IIIb began with the establishment of a new performance classification system for instrument approach systems in ICAO Annex 10. This new ICAO classification system clearly recognized that the overall performance of a particular facility was much more germane than its black box configuration. This significant change in international criteria also enabled the Type II facilities to fully comply with ICAO guidelines and therefore enabled the establishment of CAT III approach

AW/OPS 1.1.053	 CAA	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

procedures for these facilities. Therefore, a facility classified as IIIE4 meets all requirements for CAT ecifies the integrity level provided by the facility (I, II, or III); the last point along the runway where the localizer course structure meets flight inspection criteria (Point C, D, or E); and the continuity of service (reliability) level for the facility (1, 2, 3, or 4). Therefore, a facility classified as IIIE4 meets all requirements for CAT IIIb operations with conventional autoland systems. This particular classification means that the facility has CAT IIIb integrity, has been flight inspected to CAT IIIb tolerances through rollout, and that it provides CAT IIIb continuity of service. In the future it might be possible, however, to conduct CAT IIIb operations using a facility which is classified as a ID2, provided the airborne equipment was designed so that the aircraft could be safely landed independent of any ground based equipment, once the aircraft has been established on the ILS/MLS final approach course. An example of such airborne equipment would be a properly designed millimeter wave radar and forward looking infrared system.

4.6.5. Program to Upgrade.

The program to upgrade all Type II facilities that were used for CAT III operations to support full CAT IIIb operations was initiated in 1985. This upgrading effort implemented the new ICAO classification system and resulted in several changes to the configuration and performance of the Type II systems. The most significant changes included: the installation of a remote ILS status indicator to immediately alert the ATC facility when the ILS system was performing out of tolerance; the establishment of a requirement to confirm on a daily basis that the localizer far field monitors were functioning properly; and, the adjustment of the localizer course alignment to full CAT his upgrading effort implemented the new ICAO classification system and resulted in several changes to the configuration and performance of the Type II systems. The most significant changes included: the installation of a remote ILS status indicator to immediately alert the ATC facility when the ILS system was performing out of tolerance; the establishment of a requirement to confirm on a daily basis that the localizer far field monitors were functioning properly; and, the adjustment of the localizer course alignment to full CAT IIIb tolerances (± 10 feet of the actual runway centerline). These changes brought the Type II facilities into full compliance with all national and international criteria for CAT IIIb operations. These changes also enabled the establishment of CAT IIIb instrument approach procedures for these facilities when that particular facility was reclassified

AW/OPS 1.1.053	 CAAI	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

in accordance with the new ICAO guidelines. The publication of the part iteria.

4.6.6. Approval Authority.

CAAI is the approval authority for the use of any ILS facility at any airport or runway for CAT III operations. All ILS facilities approved for use by Israeli operators to conduct CAT III operations are specified in operator's Operations Manual.

4.7. APPROVAL OF CAT III OPERATING MINIMA.

CAT III operating minima are established in accordance with the criteria in FAA AC 120-28, AP 1.1.053 and this handbook.

4.7.1. Aircraft New to an Operator.

With each aircraft that is new to an operator, the operator's initial CAT III operations are usually restricted at all airports for at least 6 months until the operator acceptably demonstrates its ability to satisfactorily maintain that aircraft for the various levels of CAT III operations. The actual process for introducing an aircraft that is new to an operator, obtaining reductions in operating minima for that aircraft, and the number of steps required to achieve the lowest possible operating minima for that particular operator and aircraft, depend on the operating policies and operational choices made by the operator. Although several alternatives will be discussed in subsequent subparagraphs, all alternatives must comply with the general Flight Standards policy for reductions to operating minima.

4.7.2. Policy.

The CAAI policy for reductions to minima requires that each operator of each CAT III type of aircraft (aircraft with similar flight characteristics and similar flight guidance and control systems) must follow a certain progression from CAT I operating minima through CAT II operating minima before achieving CAT III minima. Furthermore, each operator of each CAT III type of aircraft must progress through CAT IIIa operating minima to achieve CAT IIIb minima. The principal purpose of this progression requirement is to validate the maintenance program for the various categories of operation. At least 6 months of operation at each step of this reduction of minima process is necessary to properly validate the effectiveness of the AWTA operations maintenance program for that step.

4.7.3. Normal Approval Criteria. In accordance with the normal approval criteria for CAT II operations in FAA [AC 120-29](#) and AP 1.1.052A and the CAT III criteria in FAA [AC 120-28](#) and AP 1.1.053A, the reduction process would require 6

AW/OPS 1.1.053	 CAAINJT1	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

months of operation at DH 150/RVR 1600 (450 m) to validate the maintenance program before receiving approval of operations at DH 100/RVR 1200 (350 m).

4.7.4. Normal CAT IIIa Reduction.

When operating minima of DH 100/RVR 1200 are approved, the operator can apply for CAT IIIa operations and receive approval for operations with minima of RVR 1000. After 6 months of successfully maintaining the aircraft to CAT IIIa standards, the operator could be authorized standard CAT IIIa minima of RVR 700 (200 M).

4.7.5. Normal CAT IIIb Reduction.

After receiving CAT IIIa approval, the operator could apply for a CAT IIIb authorization if the aircraft was suitably equipped. The operator could then be authorized minima as low as RVR 300 (100 M) 6 months later if the CAT IIIb maintenance program was successfully validated.

4.7.6. Normal Reduction Schedule.

Under the normal approval process, the lowest possible minima for a CAT IIIb capable aircraft (RVR 300 (100 M)) would be approved at least 18 months after the initial application for CAT II operations. Although this lengthy process is necessary in certain circumstances, the operator can significantly reduce the time required to achieve the lowest minima by structuring its operations and maintenance validation programs to receive operational credit for use of the special process for minima reductions.

4.7.7. Special Process for Minima Reductions.

Since airborne equipment that is type design approved for CAT III operations has special design features which increase the safety of operations in restricted seeing-conditions, it is possible for an operator to receive special operational credit for the use of these enhanced systems. Special operational credit is obtained by the CAAI initially authorizing CAT II operations with operating minima of DH 100 and RVR 1200 (350 m) with special restrictions specified in the OpSpecs . The maintenance program is then validated in accordance with these special requirements.

4.7.8. Basic Approach.

The basic approach used in this special approval process is to structure the operational requirements and the data collection requirements so that all approaches used to validate the maintenance program are conducted using the complete CAT IIIa or CAT IIIb airborne system, as appropriate. This approach permits the data collected during

AW/OPS 1.1.053	 CAAINJT1	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

the CAT II validation to fulfill both the CAT II and the CAT IIIa requirements, and thereby bypassing the need for the RVR 1600 (450 m) and RVR 1000 (300 m) minima reduction steps. For an operator to receive this credit, however, it is essential that the aircraft be operated to full CAT III standards throughout the validation process and that the CAT II OpSpecs contain a restriction to operate the aircraft in the fail passive or fail operational configuration, as appropriate, for the first 6 months of CAT II operation. Further reductions in operating minima are obtained in accordance with the guidance and direction in the subparagraphs that follow.

4.7.9. Fail Passive Systems.

For fail passive systems, the special reduction process would require 6 months of operation at DH 100 and RVR 1200 (350 m) with a restriction that requires the operator to operate in the fail passive mode to touchdown. After successfully completing this validation, the CAT II restriction to operate in the fail passive mode can then be removed and the operator authorized for CAT IIIa minima of DH 50 and RVR 700 (200 M). This means that the lowest minima for these aircraft could be achieved 6 months after the initial application for CAT II approval.

4.7.10. Fail Operational Systems.

For fail operational systems, the first 6 months of operation must be conducted at DH 100 and RVR 1200 (350 m) with a restriction to operate in the fail passive or fail operational mode through touchdown and rollout. After successful completion of this validation, the CAT II restriction to operate in the fail passive or fail operational mode will be removed and the operator will be authorized for CAT IIIa minima of RVR 700 (200 M) with a restriction to operate in the fail operational mode through touchdown and rollout for 6 additional months. After successful completion of this second validation period, the operator would be authorized to conduct CAT IIIb operations with the lowest possible minima. The lowest possible minima would be RVR 300 (100 M) , unless the aircraft is restricted to higher minima by the CAT IIIb type design approval. The CAT IIIa restriction to operate in the fail operational mode will be removed for aircraft smaller than the DC-10/L-1011 if the operator requests approval to conduct fail passive CAT IIIa operations. This means that the lowest minima for these aircraft could be achieved 12 months after the initial application for CAT II operations is approved.

4.8. STANDARD CAT III OPERATIONS.

AW/OPS 1.1.053		OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

4.8.1. Building Block Approach.

Standard CAT III operating minima must be based on a building block approach which uses the foundations provided by the special aeronautical knowledge, experience, skills, qualifications, training, and the special airborne and ground based equipment specified in FAA [AC 120-29](#) for CAT I and CAT II operations. The assumptions and criteria used in aircraft certification and CAT III instrument approach procedure design must be compatible with the operational concepts in this handbook. These requirements must also ensure that flightcrews and aircraft which meet the requirements of this handbook and [FAA AC 120-28](#) can be used to safely conduct CAT III operations with standard CAT III minima. Any special equipment or procedures necessary to achieve this objective must be specified in the airworthiness certification basis of the aircraft (type certificate or supplemental type certificate) and/or the FAA approved aircraft flight manual. Aircraft which cannot be safely operated with standard CAT III operating minima using flightcrews which meet the minimum requirements of this handbook and [FAA AC 120-28](#) shall not be certificated or otherwise approved for CAT III AWTA operations. The OpSpecs establish the lowest operating minima which can be used in any CAT III operation even if the instrument approach procedure specifies minima lower than these values. Special airborne equipment, special ground based equipment and special flightcrew training is required for CAT III operations. These requirements are specified in this handbook, [AC 120-28](#), and the CAAI-approved aircraft flight manuals.

4.8.2. Standard CAT III Operating Minima.

Standard CAT IIIa operating minima are DH 50 and RVR 700 (200 M) for fail passive systems and either AH 100 or AH 50 and RVR 700 (200 M) for fail operational systems. The CAT III DH used in all fail passive operations and some unique fail operational operations must be based on RA information. Barometric altimeter information is not an acceptable means of establishing AH or DH in any CAT III operation.

4.8.3. Higher Than Standard CAT III Operating Minima.

Higher than standard CAT III minima are used in certain special cases. These minima are usually applied as interim minima for the first 6 months of CAT IIIa and CAT IIIb operations with an aircraft new to an operator until that operator's maintenance program for that aircraft is validated for standard minima. Higher than standard minima are also applied in special situations where RVR reporting system limitations, prethreshold terrain limitations, or unique design

AW/OPS 1.1.053	 CAAINJT1	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

features in a particular aircraft which preclude the use of standard CAT III minima.

4.8.4. Operational Approval Basis.

All standard CAT III operations are approved by the issuance of OpSpecs, which authorize the conduct of CAT III instrument procedures at specified airports. The basis for the approval of all CAT III airplane operations is [AC 120-28](#) and AP 1.1.053A.

4.8.5. CAT III Flight Guidance and Control Systems.

Standard CAT III operations are based on the use of special airborne and ground based equipment, which provide increased capability, redundancy, integrity, and continuity of service. The overall performance of the CAT III airborne equipment must be superior to the equipment required for CAT I and CAT II operations. The very limited seeing-conditions available in CAT III operations and the piloting limitations associated with operating in these conditions do not permit the pilot to use visual cues to manually control and maneuver the aircraft during the final stages of approach, flare, and landing (deceleration and air taxi for rotorcraft). Therefore, the flightcrew must rely on the airborne and ground based equipment to safely deliver the aircraft to the touchdown zone.

4.8.6. Generic Design Philosophy.

The airborne system and the ground based system must be able to detect all potential failures, which could significantly disturb the flightpath of the aircraft. The ability of these systems to detect such failures requires special design practices and system redundancy. The airborne systems require at least two independent flight guidance and control computations (dual channel) for detecting significant errors. The airborne system detects errors by comparing the results of these computations. If the results of the calculations are not equivalent, the system knows that an error has occurred. Autoland systems are designed to prevent the autopilot from making control inputs, which would significantly disturb the flightpath when these errors occur. Autoland systems also provide the flightcrew with an immediate aural and visual warning when these failures are detected when an immediate crew action is required (such as initiating a go-around). Heads-up display (HUD) systems must also detect significant failures and provide similar warnings when failures occur. Since the pilot is manually maneuvering the aircraft in HUD operations, HUD systems are generally designed to prevent undesired control inputs as a result of failures by denying the

AW/OPS 1.1.053	 CAAINJ11	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

pilot any further access to the erroneous information and by clearly annunciating the failure.

4.8.7. Fail Passive Design Philosophy.

Fail passive systems usually use only two independent sets of flight guidance and control computations (dual channel). If an error is detected during the comparison process, fail passive systems cannot determine which computation is erroneous since only two solutions are available. Since fail passive systems cannot determine which control computation is incorrect, the system fails (disconnects for autoland systems) and immediately provides an aural and visual warning. This warning notifies the flightcrew that immediate action is required (for example, initiating a go-around). Fail passive capability is typically provided by either two autopilots (two black boxes) each of which has a single flight control computation capability (single channel) or one autopilot (one black box), which provides two independent flight control computations (dual channel). The dual, single channel systems are typically used by Boeing aircraft and the single dual channel systems are typically used by Airbus, Douglas, Flight Dynamics (HUD), and Lockheed.

4.8.8. Fail Operational Design Philosophy.

Fail operational systems must use at least three independent sets of flight guidance and control computations (triple channel) to detect errors and determine which two calculations remain valid. If an error is detected during the comparison process, fail operational systems remain fully operational by comparing all of the calculations to determine which computation is erroneous. The calculation which disagrees with the rest of the computations is disregarded by the system and the commands from that computation channel are disabled (the bad calculation is voted out by majority rule). The fail operational system remains fully operational by continuing to use the remaining computations to provide flight guidance and control. Since the system remains fully operational when failures occur, there is no need for immediate crew action or intervention to safely complete the landing. The systems which remain functional following these failures provide adequate redundancy and integrity to safely complete the landing. Fail operational capability is typically provided by either three autopilots (three black boxes) each of which has an independent flight control computation capability (single channel) or two autopilots (two black boxes) each of which has a dual independent computation capability (dual channel). The triple single channel systems (triple single) are typically used by Boeing

AW/OPS 1.1.053	 CAAI	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

aircraft and the dual channel systems (dual dual) are typically used by Airbus, Douglas, and Lockheed.

4.8.9. Airworthiness of CAT III Airborne Equipment.

There is only one acceptable means for demonstrating that the airborne equipment is airworthy for CAT III operations. This means of approval is CAT III type design approval which is normally reflected in the approved aircraft flight manual. Inspectors shall not approve CAT III operations with any aircraft for any operator unless the operator presents written evidence of CAT III type design approval for the particular aircraft.

4.8.10. Validation of the CAT III Maintenance Program.

The reliability required in the airborne system to conduct CAT III operations is achieved by special design requirements and special maintenance programs. The extensive, special maintenance program necessary for CAT III operations is usually the largest economic factor affecting an operator's decision to conduct these operations. If the operator's aircraft are equipped with standard CAT III equipment, all CAT III operations with aircraft that are new to that operator are usually initially restricted (for 6 months) to higher than standard CAT IIIa operating minima until the operator successfully validates its maintenance program in accordance with [AC 120-28](#). It may be possible for the operator to be initially authorized for standard CAT IIIa minima (RVR 700 (200 M)), however, if the operator receives operational credit for using the special process for minima reductions.

4.8.11. CAT III Airports and Runways (Israeli Operators).

All CAT III operations are restricted to airports and runways which meet the special safety requirements necessary for CAT III operations. Approval of CAT III in the OpSpec authorize the operator for CAT III operations at all countries and airports for the particular aircraft.

4.9. SPECIAL CAT III OPERATIONS.

Special CAT III operations are those operations which require special airborne equipment, special ground based equipment, or special procedures to conduct CAT III operations. Special CAT III operations include those operations, which are granted operational credit for the use of special airborne capabilities, such as HUD or millimeter wave radar and infrared systems or satellite-based systems, as well as operations, which require the use of special equipment and/or performance capabilities to conduct standard CAT III operations. Special CAT III operations also include those operations which use special ground based

AW/OPS 1.1.053	 CAAI	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

equipment, special aircraft performance, and special procedures to conduct CAT III operations which cannot be safely conducted by conventional aircraft using standard airborne CAT III equipment and procedures (for example, steep angle CAT III MLS approaches). All requests to conduct a special CAT III operation must be forwarded to CAAI Ops Department . Ops Department will evaluate each CAT III operation on a case by case basis and will provide additional guidance and direction for the evaluation and approval of these requests.

4.10. **CAT III TERMINAL INSTRUMENT APPROACH PROCEDURES**

4.10.1. **Operations.**

All CAT III operations must be conducted in accordance with the operator's CAT III OpSpecs.

4.10.2. **Authorized Procedures.** Procedures Authorized in the OpSpecs and OM contain specifications for the CAT III instrument approach procedures, runways, operating minima, limitations, and aircraft authorized for CAT III operations for a particular operator. These paragraphs also specify the CAT III airborne equipment, RVR equipment, pilot qualification, and missed approach requirements, which apply to a particular operator's CAT III operation. If the flightcrew is properly qualified and the aircraft is properly equipped and maintained, an operator can, in general, be authorized to conduct CAT III AWTA operations to any runway approved for CAT III operations . The exception to this are those runways specified as restricted CAT III runways. The prethreshold terrain at restricted CAT III runways requires additional analysis and flight testing before CAT III operations can be approved for these runways.

4.10.3. **CAT III Approach and Landing Minima.** AP 1.1.053 (latest edition), [AC 120-28](#) and this handbook establish the lowest approach and landing minima that can be authorized, under any circumstances, for CAT III operations. The lowest minima for each kind of CAT III operation for a particular operator are specified in the OpSpecs, as appropriate.

4.11. **CAT III EVALUATION AND APPROVAL PROCESS.**

4.11.1. **Approval Process.**

The approval process for CAT III operations is generally the same as the generic approval process for approval or acceptance. The CAT III approval process also closely parallels the CAT II process. The discussion in this paragraph contains specific criteria and direction related to the

AW/OPS 1.1.053	 CAAINJ11	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

evaluation and approval of CAT III operations. An in depth discussion of the evaluation and approval process for CAT II/III operator qualification is contained in section 8 of this chapter.

4.11.2. **General.** Conceptually, CAT III AWTA operations are based on the building block approach using the foundation provided by the CAT I and CAT II building blocks. Therefore, the discussion to follow includes only those factors that are unique to CAT III operations. When evaluating an operator's request to conduct CAT III operations, the inspector must evaluate the factors addressed in this paragraph and make a judgment related to the operator's ability and competence to conduct these operations. The inspector shall ensure that the operator specifies the conditions necessary to safely and competently conduct the proposed operations, and that those conditions ensure that the following criteria are met:

- Operations are restricted to those aircraft that are properly equipped and airworthy for the CAT III operation being conducted;
- Compliance with the regulatory requirements for those operations;
- Compliance with the CAT III requirements of the OpSpecs ;
- Compliance with the CAT III requirements of this handbook;
- Compliance with the CAT III criteria of [AC 120-28](#) ;
- Accepted, safe CAT III operating practices are provided;
- The use of the stabilized approach concept in all CAT III operations is required (see section 4 of this chapter);
- CAT III operations are restricted to those pilots who are properly trained, experienced, qualified, and proficient for CAT III operations;
- CAT III operations are restricted to those airports and runways that are approved for CAT III operations ;
- Fail passive CAT III operations are restricted to those aircraft approved for these operations;
- CAT IIIb operations are restricted to those aircraft that meet the CAT IIIb requirements of [AC 120-28](#);
- CAT IIIb RVR 300 (100 M) operations are restricted to those airports specifically approved for these operations;
- CAT III operations at runways designated as restricted CAT III runways are restricted to only those aircraft approved for these operations ; and
- Airport/Runway and ground-based equipment requirements.

AW/OPS 1.1.053	 CAAI	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

4.11.3. **General.** The adequacy and suitability of the airport/runway and the ground based electronic and visual aids for the type of aircraft and the kind of operation being conducted are an integral part of evaluating and approving CAT III operations.

4.11.4. **Ground-Based Visual Aids.**

One of the primary factors in achieving CAT III operations is related to ground-based lighting aids. All CAT III operations are based on the use of serviceable high intensity approach lighting systems ; high intensity runway edge lights; high intensity touchdown zone lights; high intensity runway centerline lights; and runway markings . Sequenced flashing lights - ICAO Annex 14, does not require sequenced flashing lights for CAT III operations. CAT III operations can be conducted at airports that do not have sequenced flashing lights For CAT IIIb operations with operating minima below RVR 600 (175 M), high intensity taxiway centerline lights are required for the taxi routings used in CAT IIIb weather conditions .

4.11.5. **ILS Performance Requirements.**

The safety of CAT III operations is heavily influenced by several characteristics of the ground based electronic guidance system, which include: the course structure (ILS signal quality); the integrity (the degree of trust that can be placed on the precision of the guidance signals); and continuity of service (protection from loss of the guidance signals) of the system. CAT IIIa operations can only be conducted at locations where the ground based ILS provides acceptable glidepath angles, threshold crossing heights (TCHs), and acceptable lateral and vertical course structure down to touchdown. CAT IIIb operations can only be conducted if these requirements are met through rollout.

4.11.6. **ILS Critical Areas.**

The operation of vehicles and aircraft on or near the runway or the ILS antennas can significantly disturb the course structure of the electronic signal radiated by these systems. Critical areas have been established to eliminate these undesirable disturbances. Vehicles and aircraft must not be permitted within these critical areas when an aircraft on approach is critically dependent on ILS guidance. The critical areas which must be protected during CAT III operations are specified in . The ATC procedures for providing critical area protection are specified in . The signing and marking requirements for the critical areas are specified in .

AW/OPS 1.1.053	 CAAINJT1	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

4.11.7. **RVR Reporting Equipment.**

The restricted seeing-conditions and the short term variability in the weather conditions associated with CAT III operations require the use of RVR reporting systems to provide meaningful seeing condition reports to pilots. Three RVR reporting systems must be installed at all runways used for CAT III operations. The touchdown zone and mid RVR reports are controlling for all CAT IIIa operations. In CAT IIIa operations, the rollout RVR report provides advisory information to pilots. For CAT IIIb operations, the touchdown zone, mid, and rollout RVR reports are controlling. Although three RVR reporting systems must be installed at all runways used for CAT III operations, for CAT IIIb operations using fail operational landing systems that incorporate a serviceable fail operational rollout control system, CAT III operations may continue to be conducted in the event any one of these RVR reporting systems is unserviceable. In this case, both of the remaining RVR reports are controlling. Additional information on RVR systems can be found in [AC 120-28](#) and [AC 97-1](#).

4.11.8. **Obstacle Clearance Limitations.**

Standard CAT III operations can only be conducted to runways, which provide adequate obstacle clearance protection in the final approach area, the approach light area, the touchdown area, and the missed approach area. Obstacle protection must also be provided within the obstacle-free zone (OFZ) and the runway safety area, which encompasses and surrounds the CAT III runway. These areas are identified in [AC 120-29](#), and [AC 150/5340-18](#), Airport Design.

4.11.9. **Authorizing an Operator.**

Before authorizing an operator to conduct CAT III operations with a particular aircraft, the inspector must ensure that the operator fully understands CAT III operational requirements and provides the policies, guidance, training, and procedures necessary to address these criteria in company manuals and training programs. The inspector must also determine that the operator's overall CAT III program ensures that the following criteria will be met during the conduct of these operations.

4.11.9.1 Operations must be restricted to those airports and runways approved for CAT III operations.

4.11.9.2 CAT III operations must not be conducted at any airport or runway unless the airport facilities and services meet the following criteria for CAT III operations for the particular aircraft.

4.11.9.3 The runways used must provide an effective runway field length of at least 1.3 times the landing field length required by the aircraft being used. These field

AW/OPS 1.1.053	 CAAI	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

lengths are necessary to account for the tendency to land long due to the characteristics of CAT III landing systems, and also to the pilot's increased difficulty in determining vertical height and in precisely assessing the flare and touchdown point in the reduced seeing-conditions associated with CAT III operations.

4.11.9.4 The runways must be equipped with serviceable approach, runway, touchdown zone, runway centerline and taxiway centerline lighting systems as required by this handbook, and [AC 120-28](#) .

4.11.9.5 The runway safety areas, obstacle-free zones, and ILS/MLS critical areas must be adequately protected for CAT III operations.

4.11.9.6 The ATC facilities and services must be compatible with the CAT III requirements.

4.11.9.7 The safety facilities and services (crash, fire, and rescue) must be adequate to support CAT III operations with that particular aircraft (see AC 150/5210-9).

4.11.9.8 The weather reporting systems must support these operations and the required RVR reporting systems must be serviceable.

4.11.9.9 The aeronautical information system must be adequate for CAT III operations (NOTAMs and automated terminal information service (ATIS), as well as the status of the airfield, runways, NAVAIDs, lighting systems, and RVR reporting systems).

4.11.10. Approval of Airports and Runways.(Not Applicable for CAAI)

The airports and runways approved for CAT III operations for a particular operator and aircraft are authorized in the standard OpSpecs , as applicable. Any restrictions or limitations related to the operation of a particular aircraft at a particular runway must also be specified in these paragraphs. Inspectors shall not authorize CAT III operations to any runway unless that runway is approved for CAT III operations for that aircraft type . When evaluating and approving an operator's overall CAT III program, an inspector must consider the program's ability to account for at least the following factors in designating airports and runways to support its CAT III operations.

- The suitability of the runways, runway field lengths, taxiways, and other maneuvering areas on the airport considering the seeing-conditions associated with these operations;
- The CAT III instrument approach procedures authorized, and the NAVAIDs required for these operations;

AW/OPS 1.1.053		OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

- Procedures for CAT III protection of the runway safety areas, obstacle-free zones, obstacle critical areas, ILS/MLS critical areas, and the runway/taxiway incursion prevention procedures (This also includes procedures to control and regulate the ground movement of aircraft and vehicles in these restricted seeing-conditions.);
- The ATC facilities and services required for CAT III operations;
- Safety facilities and services (for example, crash, fire, and rescue) required and any special procedures needed for these operations;
- RVR reporting and weather reporting/forecasting services required;
- Aeronautical information services (such as NOTAMs , ATIS) required for these operations;
- Adequacy of lighting, marking, and other visual aids necessary to support these operations;

AW/OPS 1.1.053	 CAA	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

4.11.11. **Airborne Equipment Required for CAT III Operations.**

4.11.11.1 The airborne equipment required for CAT III operations is based on the building block approach. The CAT III equipment requirements are based on the foundation provided by the basic CAT I and CAT II equipment requirements. This subparagraph only addresses the additional equipment, which must be serviceable for CAT III operations. The only acceptable means of obtaining airworthiness approval for CAT III operations is type design approval, which is usually obtained during aircraft certification testing.

4.11.11.2 The only aircraft, which are currently authorized to conduct CAT III operations, have been evaluated and approved for these operations during aircraft certification testing. These aircraft have received type design approval for CAT III operations and further operational demonstration of airworthiness is unnecessary. The equipment required to conduct CAT III operations with these aircraft is determined by comparing the equipment specified by the CAA-approved aircraft flight manual for CAT III operations with the equipment specified (in [AC 120-28](#)) for these operations. All of the CAT III equipment specified in the aircraft flight manual is required. Any additional equipment specified in [AC 120-28](#) is also required for these operations. Therefore, both the approved aircraft flight manual and [AC 120-28](#) must be considered in determining the required equipment.

4.11.12. **CAT III Pilot Training Program.**

The operator's approved training and qualification program must provide the flightcrews with the CAT III skills, knowledge, proficiency, and qualification necessary to safely conduct CAT III operations. The use of the stabilized approach concept is mandatory for all CAT III operations. It is national policy and direction that all operators should be encouraged to use the Standard Approach Procedures for all CAT III operations. The training and qualification curriculum changes necessary for CAT III operations are directly related to the need for increased precision in flightpath control due to the reduced seeing-conditions encountered in these operations.

4.11.12.1 The CAT III ground training curriculum segments must include the following:

- Required ground based visual aids,
- Required ground based electronic aids,
- threshold crossing height (TCH) requirements for that particular aircraft,

AW/OPS 1.1.053	 CAAINJT1	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

- Required airborne equipment,
- Authorized minima,
- Controlling RVR requirements,
- Limitations and use of RVR information,
- CAT III critical areas and the critical need to protect these areas,
- Required crew duties and responsibilities,
- Seeing-conditions associated with the transition from instrument to visual flight,
- Essential nature of maintaining a full-time instrument reference by one pilot throughout the approach and landing,
- Critical nature of proper eye reference position (proper sitting height)
- Required pilot training and qualifications,
- Methods for determining that the aircraft is airworthy for CAT III operations, and
- Dispatch/flight release requirements.

4.11.12.2 The flight training requirements depend on the equipment installed (autoland or HUD), the operating procedures used, and the kinds of CAT III operation authorized (fail passive or fail operational). The primary objective of the flight training is to ensure that the flightcrew has the skills, knowledge, proficiency, and qualifications necessary to meet the operational concepts and criteria for CAT III operations. The flightcrews must also be able to demonstrate in flight, or through an acceptable simulation, the competence necessary to safely conduct these operations. To satisfactorily demonstrate competence, the pilot must successfully accomplish the required maneuvers in accordance with the policies, criteria, procedures and crew duties specified in this handbook, [AC 120-28](#), and the specific operator's operating manuals and approved qualification program. The CAT III flight training curriculum segment must include sufficient flight training to permit pilots to acquire the knowledge and develop the skills and abilities necessary to demonstrate competence in the following areas (see [AC 120-28](#) for additional guidance):

- Determination of AH and/or DH, including the use of RAs and, if appropriate, the inner markers;
- Recognition of, and proper reaction to, significant CAT III system failures before passing the AH or DH, as appropriate;
- Proper missed approach techniques and the expected height loss as it relates to manual or automatic go-around and the go-around initiation altitude;

AW/OPS 1.1.053	 CAAI	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

- The use and limitations of RVR information, including determination of controlling RVR and the number and locations of the RVR reporting systems required;
- The availability and limitations of external visual cues during the latter stages of the approach, flare, and landing. This includes at least the following factors;
- Proper procedures to be used for unexpected deterioration of seeing-conditions (to less than the authorized RVR) during approach, flare, and rollout;
- Achieving the proper eye reference position (proper sitting height) and the expected external visual references with the weather at authorized minima;
- The appearance and expected sequence of visual cues during approaches and landings at the authorized minima;
- The effects of vertical and horizontal wind-shear (in CAT III weather conditions) on system performance, the proper procedures to be used in these wind-shear encounters, and the wind limitations for these operations;
- The proper procedures for transitioning from instrument to visual flight;
- Recognition of the limits of acceptable aircraft position and flightpath tracking in the approach, flare, and landing with special emphasis on tracking performance in the decision region; and
- Recognition of, and reaction to, significant airborne or ground system faults or abnormalities during the approach, flare, and landing.

4.11.12.3 Each PIC and SIC used in CAT III operations must satisfactorily demonstrate the ability to safely conduct CAT III operations to either a company check pilot or an CAAI inspector during initial and recurrent CAT III qualification. The events and/or maneuvers which must be demonstrated depend on the airborne equipment installed, the kinds of CAT III operations authorized, and the crew duties and responsibilities used by that operator. See [AC 120-28](#) for a more detailed description of these requirements.

4.11.13. Operations Manuals, Crew Duties, and Responsibilities.

The operator's manuals must contain clear and concise policy, criteria, guidance, and direction to its flightcrews and other persons involved in its CAT III operations. To be acceptable, these manuals must meet the criteria of the CFRs , this handbook, and the appropriate CAT III advisory circulars. These manuals must adequately address the following:

AW/OPS 1.1.053	 CAA	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

- Airport and runway requirements, including the additional runway field length required;
- Airborne and ground based equipment required for the various minima;
- Methods for determining that the aircraft is airworthy for the intended operation, including MEL/CDL requirements;
- Flightcrew procedures, crew duties and responsibilities;
- Instrument approach procedures and minima authorized;
- Pilot training and pilot qualifications; and
- Any operating restrictions or limitations necessary to safely conduct these operations (see [AC 120-28](#) for further information).

4.11.14. **Maintenance Program.**

Before approving the operator's proposal, the inspector must ensure that the operator's CAT III continued airworthiness program includes the special airborne equipment and procedures required for CAT III operations. Close coordination with the principal maintenance inspector (PMI) and the principal avionics inspector (PAI) is essential before granting operational approval. The inspector shall not issue OpSpecs that authorize CAT III operations until all requirements are met. This includes approval of the operator's CAT III maintenance program for the particular aircraft involved.

4.11.15. **Review and Concurrence.**

Due to the specialized technical nature of CAT III operations and the need to standardize these operations on a national and international basis, each make, model and series of aircraft used for CAT III operations must be individually approved for each operator. All initial proposals for CAT III operations for each make, model, and series used by each operator must be forwarded to the CAAI, for their review and concurrence before the OpSpecs can be issued authorizing the operation. Any modifications required for approval of the proposal will be specified in the CAAI response to the proposal. Subsequent proposals for reductions in CAT III operating minima for that particular make, model, and series of aircraft used by the particular operator also require review and concurrence before the reduction can be authorized (see [AC 120-28](#) for further guidance).

5. Task Outcomes

5.1. **OPERATIONS SPECIFICATIONS FOR CAT III OPERATIONS.**

CAT III operations approvals are granted by issuance or amendments to OpSpecs .

AW/OPS 1.1.053	 CAAINJT1	OPS Inspector Handbook
Category III Operations		Revision 3
		02 Mar 14

5.2. The authorizations, limitations, and provisions applicable to CAT III operations for a particular aircraft's use by an operator must be specified in appropriate OpSpecs .

5.3. Inspectors shall not, under any circumstances, issue OpSpecs approving any particular CAT III operation until all requirements are met (including the PAI's approval of the operator's CAT III maintenance program for that aircraft) and until the operator is currently capable of commencing safe CAT III operations.