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GOVERNMENT OF INDIA

OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION
TECHNICAL CENTRE, OPP. SAFDARJUNG AIRPORT, NEW DELHI-110 003

CIVIL AVIATION REQUIREMENTS
SECTION 7 – FLIGHT CREW STANDARDS
TRAINING AND LICENCING
SERIES 'X', PART I
30TH MARCH 2001

EFFECTIVE: FORTHWITH

Subject: Pilot Authorisation for ILS Category-II and Category-III Operations

1. Introduction

With the modernisation of airport facilities in the country, Instrument Landing System (ILS) capability is being upgraded to Category-II and Category-III levels at some of the airports to permit operations even in lower visibility conditions. The operations in such weather conditions shall, however, be possible only when all other requirements relating to aircraft, pilots, operator etc. are also complied with. This CAR lays down the minimum requirements for training and grant of authorisation to pilots for ILS Category-II and Category-III operations. This CAR is issued under the provisions of Rule 133A of the Aircraft Rules, 1937.

2. Definitions

Categories of Precision approach and landing operations

Category-II (Cat-II) Operation : A precision instrument approach and landing with:

- a) Decision Height lower than 200 ft (60m) but not lower than 100 ft (30m); and
- b) a Runway Visual Range not less than 300m.

Category-III A (Cat-III A) Operation : A precision instrument approach and landing with:

- a) a Decision Height lower than 100 ft (30m), but not lower than 50 ft (15m); and
- b) a Runway Visual Range not less than 175 m.

Category-IIIB (Cat-IIIB) Operation: A precision instrument approach and landing with:

a) No Decision Height or a Decision Height lower than 50 ft (15 m).

b) Runway Visual Range less than 175 m but not less than 50 m.

Note: Where the decision height and Runway Visual Range (RVR) do not fall within the same Category, either the Decision Height or the RVR may determine in which Category the operation is to be considered. The operation will be in the Category with the lower minima.

Alert Height: An Alert Height is a height above the runway based on the characteristics of the aeroplane and its fail operational Automatic Landing System, above which a Category-III approach would be discontinued and a missed approach initiated if a failure occurred in one of the redundant parts of the Automatic Landing System, or in the relevant ground equipment.

Decision Altitude/Height (DA/H): A specified altitude or height (A/H) in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Note 1 *Decision Altitude (DA) is referenced to Mean Sea Level (MSL) and Decision Height (DH) is referenced to the threshold elevation.*

Note 2 *The required visual reference means that section of the visual aids or of the approach area which shall have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.*

Fail-passive Automatic Landing System : An Automatic Landing System is fail-passive if, in the event of a failure, there is no significant deviation of aeroplane trim, flight path or attitude but the landing will not be completed automatically.

Fail-operational Automatic Landing System: An Automatic Landing System is fail-operational if, in the event of a failure, the approach, flare and landing can be completed by the remaining part of the automatic system.

FOR SCHEDULED OPERATORS

3. Qualifications and Flying Experience Requirements

The pilot seeking authorisation for ILS Cat-II or Cat-III operations shall meet the following qualifications and experience requirements:

a) Licence and Ratings

i. Current CPL or higher licence.

ii. Instrument Rating

b) Flying Experience for PIC

- | | |
|----------------------------|--|
| i) Total flying experience | 2500 hrs |
| ii) PIC experience on type | 500 hrs. (for initial authorisation).
200 hrs (for additional aircraft type authorisation). |
| iii) Night Flying on type | 100 hrs. |
| iv) Instrument Flying | 100 hrs (including not more than 50 hrs. on Full Flight Simulator of the type). |

c) Flying Experience for Co-Pilot

- | | |
|----------------------------|--|
| i) Total flying experience | 500 hrs |
| ii) On type experience | 300 hrs (for initial authorisation).
200 hrs. (for additional aircraft type authorisation). |
| iii) Instrument Flying | 100 hrs. (including not more than 50 hrs. on Full Flight Simulator of the type) |

4. Ground Training for PIC, Co-Pilot and Flight Engineers for Cat-II and Cat-III Authorisation

Details of the ground training are given in Annexure-I. The ground training shall lay specific emphasis on the following :

- i) All the technical aspects required for ILS Cat-II and Cat-III operations, the aircraft equipment required for carrying out ILS Cat-II and Cat-III approaches and associated weather phenomenon, with special emphasis on poor visibility in fog, rain, meteorological minima etc. This training shall be given by Ground Instructor/ Flight Instructor/ Synthetic Flight Instructor.
- ii) The techniques for ILS Cat-II and Cat-III operations, effects on operations due failures in the airborne and ground equipment and their indications, and action required to be taken on various failures. This training shall be given by Flight Instructor/Synthetic Flight Instructor.

5. Simulator Training and Line Flying for ILS Cat-II/Cat-III authorisation

The training exercises stipulated hereunder shall be the minimum to be carried out on an approved simulator. The Instructor and the Examiner shall ensure that the pilot acquires the required proficiency and if necessary additional training be given.

In case of a gap between ground classes/ simulator training of more than six months the pilot shall undergo a simulator training session of at least one hour

5.1 Training for PIC/Co-pilot

Simulator Training

- (a) Training session(s) of minimum of 3 hours consisting of a minimum of 15 ILS Cat-II approaches in which at least 4 landings and 4 go-around shall be accomplished. Auto-landings shall also be practised, if the aircraft is equipped and certified for autolandings. The exercise shall also include approaches with one engine inoperative for landing and go-around. Low visibility takeoffs and reject take-offs due to engine failure at low speeds and high speeds shall be carried out. Handling of failures and taking necessary corrective action shall also be part of the training. Detailed syllabus is at Annexure-II.
- (b) One session of 1 hour by an Examiner to check the proficiency for ILS Cat-II operations including engine failure on approach and go-around and recognition of aircraft and ground equipment failures and to take necessary corrective action. Performa given at Annexure-III shall be used to check the proficiency.
- (c) Only on successful completion of simulator training for Cat-II Operations, Pilot shall undergo one session of 2 hours consisting of at least six ILS Cat-III approaches including auto-landings and go-around with all engines operating, critical engine failure and also with equipment failures and to demonstrate ability to take necessary corrective actions to handle the failures. Detailed syllabus is at Annexure-IV.
- (d) One evaluation session by an Examiner to check the proficiency for ILS Cat-III operations consisting of a minimum of 2 approaches. Performa at Annexure-V shall be used to check the proficiency.

Note: The Co-pilot shall be part of flight crew composition when simulator training and evaluation session by Examiner is being conducted for PIC as stipulated above.

INCAPACITATION EXERCISE FOR P2

Aircraft Line Flying

For PIC

- i) One ILS Cat-II/ Cat-III approach in weather conditions at or above the Cat-I minima under the supervision of Flight Instructor/Examiner.

ii) Thereafter a minimum of 2 ILS Cat-II/ Cat-III practice approaches including auto-landings, if applicable, at or above the Cat-I weather minima of which 1 can be on simulator of Category D.

iii) Final release check at or above Cat-I weather minima by an Instructor/ Examiner or DGCA Flight Operations Inspector.

Note: All the above practice approaches on the aircraft can be carried out at any Category-I ILS runway where auto land is permissible and which has been approved, after flight trials, by the operator. All Operators must maintain a periodically updated list of approved airports/ runways where practice CAT II/ III approaches/ autoland may be carried out.

Aircraft Line Flying Under Supervision

The pilot meeting the qualification and experience requirements and training stipulated in paras 3, 4 and 5 shall be a Co-pilot on at least 3 ILS Cat-II/Cat-III approaches while the PIC is carrying out ILS Cat-II/ Cat-III practice approaches.

Note: Pilots cleared for Cat-II/ Cat-III operations shall carry out applicable Cat-II/ Cat-III practice approaches respectively.

5.2 Training for Flight Engineer (wherever required)

Flight Engineer, wherever required as a part of the crew complement, shall be a part of the flight crew composition when the simulator training is being conducted for PIC. He shall also have been a Flight Engineer on at least 4 ILS Cat-II/ Cat-III approaches while the PIC is carrying out ILS Cat-II/ Cat-III practice approaches on aircraft at or above Cat-I minima conditions.

6. Recurrent Training and Check

a) **Recurrent Ground Training** Recurrent ground training shall provide any remedial review of topics specified in initial Cat-II & Cat-III ground training, to ensure continued familiarity with those topics. Emphasis shall be placed on any programme modifications, changes to aircraft equipment or procedures, review of any occurrences or incidents that may be pertinent, and finally emphasis may be placed on re-familiarisation with topics such as flight mode annunciation for failure conditions or other information which the pilots may not routinely see during normal line operations. Topics to be addressed for each Pilot-in-Command and Co-pilot are those topics, necessary for the performance of the assigned duties for each respective crew member in the current assignment. This training may be completed during annual refresher training.

b) Recurrent Simulator Training

- i) For Pilot-in-Command: Pilot's knowledge and ability to perform the tasks associated with the particular category of operation for which he is authorised, is to be demonstrated during normal proficiency/IR checks. This shall include a minimum of three Cat-II or Cat-III approaches as applicable and a minimum of one go-around. A pilot shall also demonstrate the low visibility take off manoeuvres as prescribed for LVO.
- ii) For Co-Pilot: The Co-Pilot must be a part of the flight crew composition when simulator recurrent training are being conducted for PIC.
- iii) For Flight Engineer: Flight Engineer, wherever required as a part of the crew complement, shall be a part of the flight crew composition when the simulator training is being conducted for PIC.

7. Addition of Aircraft Type to Pilot's Authorisation

A pilot seeking addition of another type of aircraft to the current Category-II or Category -III authorisation must comply with the following requirements:

- (i) Shall undergo adequate ground training on technical and operational aspects of aircraft and its equipment in relation to Cat-II and Cat-III operations, effects on operations, of failures in airborne equipment and actions required to be taken on various failures.
- (ii) Simulator practice session(s) consisting of Cat-II/Cat-III approaches in which applicable exercises as for initial authorisation shall be carried out.
- (iii) One simulator session of 1 hr. by an examiner to check proficiency of PIC on the type of aircraft for Cat- II/ Cat-III operations.
- (iv) A PIC shall carry out a minimum of 3 ILS Cat-II/ Cat-III practice approaches.
- (v) A co-pilot shall have been part of the flight crew composition on at least 3 ILS Cat-II/ Cat-III approaches on aircraft.
- (vi) Release check of PIC on aircraft by an Examiner or a DGCA Flight Operations Inspector.

8. General Requirements

- i) To exercise the privileges of ILS Cat-II or Cat-III authorisation, a PIC shall have carried out a minimum of six approaches (either actual or practice) of the applicable category including at least 1 on the aircraft within the preceding 6 months, and a Co-pilot shall have been a crew member on at least 3 ILS Cat-II or Cat-III approaches as applicable, within the preceding 6 months.

- ii) Scheduled Operators shall be granted authorization for Cat-II Operations and Cat-IIIA/ Cat-IIIB Operations as per the provisions of CAR Section 8, Series B, Part I.

For NON-SCHEDULED/ PRIVATE/ GENERAL AVIATION/ OTHER OPERATORS:

- i) For all such operators where pilots have done the prescribed training AND are current within one year on a Full Flight/ ZFTT (Level D) simulator of type, Cat-I state minima shall apply for ILS approaches.
- ii) For aircraft where appropriate ZFTT Simulator is not available or does not apply, and the aircraft is capable/ certified for Cat II/ III, after the ground training applicable for Cat II/ III and a check flight with Flight Operations Inspector, the pilot will be permitted to fly down to Cat I / other approaches state minimas.
- iii) The pilots shall maintain proper record of Cat-II and Cat-III approaches, which shall be duly certified by the pilot in charge of operations or Flight Instructor/Examiner carrying out the proficiency checks as per Annexure-VI.
- iv) Authorisation of the pilot for Cat-II or Cat-III operations shall be valid for the duration of validity of his licence, provided the pilot continues to regularly fly the type of aircraft on which the authorisation has been granted and meet all the applicable requirements of this CAR, unless revoked/suspended by the DGCA. The pilot shall furnish necessary information and documents while seeking renewal of his licence to show continued compliance of necessary recurrent training and checks and the other requirements of this CAR.
- v) In case a pilot does not meet the recency requirements, he shall undergo simulator practice of at least one session and a check by an Examiner or DGCA Flight Operations Inspector before he resumes Cat-II or Cat-III operations.
- vi) The DGCA may grant authorisation for a specified period to any pilot of equivalent status approved as such by any Contracting State for carrying out Cat-II or Cat-III operations.

**Sd/-
(K. Gohain)**
Director General of Civil Aviation

ANNEXURE I

GROUND TRAINING OF FLIGHT CREW FOR CAT-II/ CAT-III OPERATIONS

Flight Crew must be able to make full use of ground and airborne equipment intended for use during Cat-II and Cat-III operations. They must, therefore, be instructed in how to obtain maximum benefit from redundancy provided in the airborne equipment and to understand fully the limitations of the total system including both ground and airborne elements. The ground instruction shall cover at least the following:

- 1. Ground System and NAVAIDs.** Ground systems and NAVAIDs are considered to include characteristics of the airport, electronic navigation aids, lighting, marking and other systems (e.g., RVR) and any other relevant information necessary for safe Cat-II/ Cat-III landing or low visibility takeoff operations.

The training and qualification program shall appropriately address the operational characteristics, capabilities and limitations of at least each of the following:

i) NAV AIDs. The navigation systems to be used, such as the instrument landing system with its associated critical area protection criteria, marker beacons, distance measuring equipment, locators or other relevant systems shall be addressed to the extent necessary for safe operations, limitations of the ILS, including the effect on aeroplane system performance of interference to the ILS signal caused by other landing, taking off or overflying aeroplanes.

ii) Visual Aids. Visual aids include approach lighting system, touch down zone, centerline lighting, runway edge lighting, taxiway lighting, standby power for lighting and any other lighting systems that might be relevant to a Cat-II/ Cat-III environment, such as the coding of the center line lighting for distance remaining, and lighting for displaced thresholds, stop ways, or other relevant configurations shall be addressed. Limitations on their use as visual cues in reduced RVRs with various glide path angles and cockpit cut-off angles, and the heights at which various visual aids may be expected to become visible in actual operations.

iii) Runway and Taxiways. The runway and taxiway characteristics concerning width, safety areas, obstacle free zones, markings, hold lines (including Cat-II/ Cat-III holding points), signs, holding spots, or taxi way position markings, runway distance remaining markings and runway distance remaining signs shall be addressed.

iv) Weather Reporting. Weather reporting and transmissiometers systems, including RVR locations, readout increments, sensitivity to lighting levels set for the runway edge lights, variation in the significance of reported values, controlling and advisory status of readouts, and requirements when transmissiometers

become inoperative, different methods of measuring the assessing RVR and the limitations associated with each method.

v) Facility Status. Facility status, proper interpretation of outage reports for lighting components, standby power, or other factors and proper application of NOTAMS regarding the initiation of Cat-II/ Cat-III approaches or initiation of a low visibility takeoff.

2. The Airborne System. The training and qualification program shall address the characteristics, capabilities, limitations, and proper use of each appropriate airborne system element applicable to Cat-II/ Cat-III landing or low visibility takeoff including the following:

i) Flight Guidance. The flight control system, flight guidance system, instruments and displays and annunciation systems including any associated flight director, landing system and roll out system, or takeoff systems, if applicable. For automatic or manual systems which require crew input for parameters such as inbound course or automatic or manually tuned navigation frequencies, the crew shall be aware of the importance of checking that proper selections have been made to assure appropriate system performance.

ii) Speed Management. The automatic throttle, FMC or other speed management system, if applicable.

iii) Instruments. Situation information displays, as applicable.

iv) Supporting Systems. Other associated instrumentation and displays, as applicable, including any monitoring displays, status displays, mode annunciation displays, failure or warning annunciations and associated system status displays that may be relevant.

v) Aircraft Characteristics. Any aircraft characteristics that may be relevant to Cat-II/ Cat-III, such as cockpit visibility cutoff angles and the effect on cockpit visibility, of proper eye height, seat position or instrument lighting intensities related to transition through areas of varying brightness, visual conditions change. Crew shall be aware of the effects on flight visibility related to use of different flap settings, approach speeds, use of various landing or taxi lights and proper procedures for use of windshield wipers and rain repellent. If windshield defog, anti-ice, or de-icing systems affect forward visibility, crew shall be aware of those effects and be familiar with proper settings for use of that equipment related to low visibility landing.

3. Weather Phenomenon

i) Characteristics of Fog

ii) Usage of Strobe Lights

iii) Usage of Landing Lights

iv) Effect of Low Level Wind Shear, Turbulence, Precipitation

v) Runway surface conditions i.e. slippery, slush, contamination etc.

4. Flight Procedures and Associated Information.

i) Operations Specification. Crew shall be familiar with, and properly able to apply, operations specifications applicable to Category-II/ Cat-III landing.

ii) Normal and Non-normal Procedures. Crew shall be familiar with appropriate normal and non-normal procedures including crew duties, monitoring assignments. Appropriate automatic or crew initiated call-outs to be used, proper use of standard instrument approach procedures, special instrument approach procedures, applicable minima for normal configurations or for alternate or failure configurations and down grading/reversion to higher minima in the event of failures. Effects of specific aeroplane malfunctions (e.g. engine failure) on autothrottle, auto-pilot, performance, etc.

iii) Weather and RVR. Crew and aircraft dispatchers shall be familiar with weather associated with Cat-II/ Cat-III and proper application of Runway Visual Range, including its use and limitations, the determination of controlling RVR and advisory RVR, required transmission meters, appropriate light settings for correct RVR readouts and proper determination of RVR values reported at foreign facilities.

iv) Use of DA(H) and Alert Height. Crew shall be familiar with the proper application of Decision Height and Alert Height, as applicable, including proper use and setting of Radar Altimeter bugs, use of the inner marker where authorized or required due to irregular underlying terrain and appropriate altimeter setting procedures for the Barometric Altimeter consistent with the operator's practice of using either QNH or QFE. Pilot tasks at DH, procedures and techniques for transition from instrument to visual flight in low RVR conditions, including the geometry of eye, wheel and antenna positions with reference to ILS reference datum height.

v) Use of Visual Reference. Crew shall be familiar with the availability and limitations of visual references encountered, both on approach before and after Decision Height, if a Decision Height is applicable. Crew shall be familiar with the expected visual references likely to be encountered if an Alert Height is used even though a visual reference requirement is not established. Crew shall be familiar with procedures for an unexpected deterioration of conditions to less than the minimum visibility specified for the procedure during an approach, flare or roll out including the proper response to a loss of visual reference or a reduction of visual reference below the specified values when using a Decision Height and prior to the time that the aircraft touches down. The operator shall provide some means of demonstrating the expected visual references where the weather is at acceptable minimum conditions and the expected sequence of visual cues during an approach in which the visibility is at or above the specified landing minimas.

This may be done using simulation, video presentation of simulated landings or actual landings, slides showing expected visual references, computer based reproductions of expected visual references.

vi) Transition to Visual Flight :Transition from non-visual to visual flight for the pilot in command during the approach. For systems, which include electronic monitoring displays, procedures for transition from those monitoring displays to external visual references shall be addressed.

vii) Acceptable Flight Path Deviations. Pilots shall be familiar with the recognition of the limits of acceptable aircraft position and flight path tracking during approach, flare and if applicable roll out. This shall be addressed using appropriate displays or annunciations for either Automatic Landing Systems or for Manual Landing Systems or when using electronic monitoring systems such as an Independent Landing Monitor.

viii) **Wind Limitations**. Environmental effects shall be addressed. Environmental effects include appropriate constraints for head winds, tail winds, cross winds, and the effect of vertical and horizontal wind shear on automatic systems, flight directors, or other system (e.g., synthetic vision) performance.

ix) Contaminated Runways. Crew shall be familiar with the operator's policies and procedures concerning constraints applicable to Cat-II/ Cat-III landings or low visibility takeoffs, on contaminated or cluttered runways. Limits shall be noted for use of slippery or icy runways as far as directional control and stopping performance is concerned, and crew shall be familiar with appropriate constraints related to braking friction reports. Crew shall be familiar with the method of providing braking friction reports applicable to each airport having Cat-II/ Cat-III landing operations or low visibility takeoff operations.

x) Airborne System Failures. Crew shall be familiar with the recognition and proper reaction to significant airborne system failures experienced prior to and after reaching the final approach fix and experienced prior to and after reaching Alert Height or Decision Height, as applicable. Expected crew response to failure after touch down shall be addressed, particularly for Cat-II/ Cat-III operations.

xi) Go-around Provisions. Pilots are expected to appropriately recognize and react to ground or navigation system faults, failures or abnormalities at any point during the approach, before and after passing Alert Height or Decision Height and in the event an abnormality or failure which occurs after touch down. Crew shall be familiar with appropriate go-around techniques, systems to be used either automatically or manually, consequences of failures on go-around systems which may be used, the expected height loss during a manual or automatic go around considering various initiation altitudes, and appropriate consideration for obstacle clearance in the event that a missed approach must be initiated below Alert Height or Decision Height.

- xii) Reporting Anomalies. Pilots shall be familiar with the need to report navigation system anomalies or discrepancies, or failures of approach lights, runway lights, touch down zone lights, center line lights or any other discrepancies which could be pertinent to subsequent Cat-II/ Cat-III operations.
- xiii) Usage of Strobe Lights and Landing Lights during Cat-II/ Cat-III approaches and their limitations.
- xiv) MEL Considerations/requirements like thrust reversers, wiper system, antiskid systems, auto-brakes etc.
- xv) Recognition of and action to be taken in the event of failure of ground equipment. Action to be taken in the event of failure of approach and landing equipment above and below Decision Height.
- xvi) Allocation of crew duties in carrying out the procedure.
- xvii) Procedure and precautions to be followed while taxiing during limited visibility conditions.
- xviii) Importance of correct seating and eye position.
- xix) Briefing procedure/tests prior to commencement of Cat-II/ Cat-III approaches.
- xx) Limitations of auto-flight system.
- xxi) Any other relevant item considered necessary by the operator.

ANNEXURE II

Simulator Training Manoeuvres for Category- II Landings

Manoeuvres may be addressed individually as Category-II manoeuvre, or an appropriate sample of Category-II manoeuvres may be carried out and evaluated, if crew are to be Category-II qualified.

Simulator training for Category-II landing shall address at least the following manoeuvres:

- 1. Normal landings.** Normal landings at the lowest applicable Category-II minima, using representative autoflight configurations or combinations of configurations authorised for use (e.g., flight director, autopilot, autothrottles),
- 2. Missed approach.** A missed approach from the lowest applicable DA (H), (may be combined with other manoeuvres),
- 3. Balked landing.** A bailed landing or missed approach from a low altitude that could result in a touchdown during go-around (balked landing or rejected landing - may be combined with other manoeuvres),
- 4. System or Navaid Failures.** Appropriate aircraft and ground system, NAVAID failures (may be combined with other manoeuvres),
- 5. Engine Failures.** Engine failure (i) prior to approach, (ii) during approach, and (iii) during missed approach. (if specific flight characteristics of the aircraft or operational authorisations require this manoeuvre),
- 6. Low Visibility Rollout.** Manual roll out with low visibility at applicable minima (may be combined),
- 7. Realistic Environmental Conditions.** Landings (in simulation) with environmental conditions at a representative sample of limiting values authorised for applicable Category-II minima (e.g., regarding wind magnitude, headwind and crosswind components, turbulence, and runway surface friction characteristics (wet, snow, slippery - may be combined), and
- 8. Non-normal configuration approaches and landings.** Representative non-normal configuration approaches and landings in instrument conditions shall be carried out. For these approaches, the simulated weather minima may be above, or well above, the lowest Category-II minima authorised. Minima shall be at levels that might typically be experienced in line operations, for a landing with the non-normal condition used. During these approaches, representative auto-flight, instrument, and aircraft system configurations or combinations of configurations shall be carried out (e.g., flight director, auto-pilot, auto-throttles, raw data, inoperative electrical or hydraulic components).

9. Basic Airmanship Skills. In accomplishing items 1 through 8 above, each pilot shall demonstrate competence, or be judged to have the necessary competence in "basic airmanship skills" to adequately address:

a) **Manual Control.** Manual control, or reversion to manual control of the aircraft, if necessary, (for FBW aircraft, normal law or configuration is acceptable)

b) **Automation.** Proper use of automation

c) **Situation Awareness.** Appropriate planning and situation awareness, including terrain awareness,

d) **Detection and coping with adverse environmental factors.** Ability to detect and cope with adverse environmental conditions (e.g., applicable crosswinds, turbulence, windshear, convective weather, or adverse airport conditions (e.g., slippery runways),

e) **Detection and coping with adverse NAVAID factors.** Detection ability to detect and cope with adverse ground system, space system, or NAVAID failures or anomalies, and

f) **Crew coordination and CRM.** Proper crew coordination, and Crew Resource Management.

10. Simulator Training Manoeuvres for Takeoffs. For low visibility takeoff, the following manoeuvres and procedures shall be addressed (may be combined):

a) **Normal takeoff,**

b) **Rejected takeoff** from a point prior to V1 (including an engine failure) at low and high speed.

c) **Continued takeoff** following failures including engine failure, and any critical failures for the aircraft type which could lead to lateral asymmetry during the takeoff, or

d) **Limiting conditions.** The conditions under which these normal and rejected takeoffs shall be demonstrated include appropriate limiting cross winds, winds, gusts and runway surface friction levels authorised. Rev. 1, 22nd November, 2005

ANNEXURE III

CAT-II PRECISION APPROACHES EVALUATION

Airline _____ Simulator Type/Category _____
 Capt. _____ Co-Pilot _____ Flt. Engg. _____
 Examiner _____
 Date _____ From _____ To _____ Time _____

Sl.No.	Exercises	Satisfactory	Unsatisfactory
	INIT T/O		
1.	Cockpit Prepared by Instructor Engine Running, Fuel Freeze		
2.	Take-Off - Holding Cat-II Briefing		
3.	Approach-2/3 AP-DH100 FT-No Visual Contact Go-around – Radar Vectors – Down wind		
4.	Approach-2/3 AP- DH 100 Ft RVR 350 mts. Auto-land		
5.	Take-Off Fog Patches Engine Failure Before 100 kts – Reject Take-off		
6.	Take-off – Fog Patches – Continue Take-off		
7.	Approach – 2/3 AP – DH 100 Ft. – 1 Auto-throttle only Remaining auto-throttle fail at 500 ft. - - auto-land (if applicable)		
8.	Approach – 2/3 AP – DH 100 ft. Loss of Loc Transmitter at 200 ft. – auto-land warning (if applicable) – Go-around		
9.	. Approach – 2/3 AP – DH 100 ft. Engine failure above 100 ft. – Go-around		
10.	Approach – 2/3 AP – DH 100 ft. Engine Failure below 100 ft. – Land or take action specific to the aircraft		
11.	Approach – 2 AP (or 1 AP with dual channels) DH 100 ft. Auto-pilot disconnect at 80 ft. – Manual Landing		
12.	Down grading to Cat-I from Cat-II approach		

Remarks, if any.

Pilot's Signature Examiner/Instructor Signature.....

Licence No. Licence No.

ANNEXURE IV

Simulator Training for Category-III Operations

Simulator training shall address at least the following manoeuvres and procedures for Category-III operations. During each of the specified manoeuvres or procedures, crew members are expected to perform their respective assignments or duties as applicable.

1. Normal landings at the lowest applicable Category-III minima.
2. A missed approach from the Alert Height or Decision Height (may be combined with other manoeuvres).
3. A missed approach from a low altitude that could result in a touch down during goaround (rejected landing).
4. Appropriate aircraft and ground system failures (may be combined with other manoeuvres).
5. Engine failure prior to or during approach.
6. Except for aircraft using an automatic Fail Operational roll out system, manual roll out in low visibility at applicable minima (may be combined).
7. Landings at the limiting environmental conditions for Category-III with respect to wind, cross wind components, and runway surface friction characteristics.

For low visibility takeoff where a flight guidance system is required, the following manoeuvres and procedures shall be addressed:

1. Normal takeoff,
2. Rejected takeoff from a point prior to V_1 (including an engine failure), at low speed and high speed.
3. Continued takeoff following failures including engine failure after V_1 , and any critical failures for the aircraft type which could lead to lateral asymmetry during the takeoff or the conditions under which these normal and rejected takeoffs shall be demonstrated include appropriate limiting cross winds, winds, gusts and runway surface friction levels authorised. A demonstration shall be done at weights or on runways that represent a critical field length.

ANNEXURE V

**CAT-III PRECISION APPROACHES
EVALUATION**

Airline _____ Simulator Type/Category _____
 Capt. _____ Co-Pilot _____ Flt. Engg. _____
 Examiner _____ Licence No. _____
 Date _____ From _____ To _____ Time _____

Sl.	Exercises	Satisfactor y	Unsatisfac tory
	INIT T/O		
1.	Cockpit Prepared by Instructor Engine Running		
2.	Take-Off - Holding Cat-III Briefing		
3.	Approach-3/2 AP-DH50 FT*-NO Visual Contact Go-around – Radar Vectors		
4.	Approach-3/2 AP- DH 50 Ft *RVR 200/ 100 mts. Auto-land		
5.	Take-Off Fog Patches – Continue Take-Off –		
6.	Approach-3/2 AP-DH50FT* RVR 200/ 100 mts. Go-around or Auto-land		
7.	Approach-3/2 AP-DH 50 FT* Visual Contact – Auto-Land Roll Out Fault		
8.	. Take-off Fog Patches Engine Failure before 100 kts - Reject Take Off		
9.	Take-off RVR Reducing -- Visual cues lost Engine Failure at High Speed (Before V1) – Reject Take-off		
10.	App. Cat-III – 3/2 AP DH 50 Ft* Loss of LOC Transmitter at 200 ft. – Auto Level Warning Go- Around		
11.	App.Cat-III Both A/P Disconnect at 50 Ft*.– Go-around		
12.	App. Cat-III - 3/2 AP DH 50 Ft.* Engine Failure below 100 Ft. – Autoland		
13.	Down grading to Cat-II or Cat-I from Cat-III		

Remarks, if any.

Pilot's Signature Examiner/Instructor Signature.....

Licence No. Licence No.

Note* DH 50 FT for Cat-III A operations or as approved to operator for Cat-III B operations.

ANNEXURE VI

RECORD OF CATEGORY-II AND CATEGORY-III APPROACHES

Name _____ Licence No. _____
Rank _____
Aircraft Type _____
Airline _____

CERTIFICATION

Category-II _____ Name of Examiner _____
Signature of Examiner _____ Licence No. _____
Category-III _____ Name of Examiner _____
Signature of Examiner _____ Licence No. _____

Date	Airport Rwy	A/c Regn	Category-II Category-III	Practice/ Actual	Remarks	Signatures