



STEEP APPROACH OPERATION PROCEDURES



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FOREWORD

This Kuwait Civil Aviation Publication (CAP: 206) provides information on the application, required equipment, the approval process, as well as guidance on operational procedures and training to conduct steep approaches operations. This guidance material is not airport specific and the principles applied could be transferred to any circumstance where steep approaches are required.

This CAP: 206 document is designed to address a phased implementation approach, which will allow the Operators in a planned and systematic way to obtain an approval from the Kuwait DGCA before the commencement of operations.

This guidance document will be updated as and when it is necessary to maintain compliance with KCASRs and ICAO standards and recommended practices.

It is hereby declared that the DGCA/Aviation Safety Department's Steep Approach Operation Procedures (CAP: 206), is approved.



**Aviation Safety Director
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1. INTRODUCTION

There are a number of aerodromes in Europe that require a steep approach approval. Example is London City (EGLC) in UK. The appropriate authorities of those States will only accept aeroplanes and operators approved by the State of Registry for such operations. The glideslope angle at this aerodrome was originally $7\frac{1}{2}^{\circ}$, but this has now been reduced to $5\frac{1}{2}^{\circ}$. This reduction, allied to an increase in TORA/ASDA/LDA to 1199 metres, allows greater flexibility and may lead to more CAT operators requesting clearance for their aeroplane(s) at this aerodrome.

1.1 General

This document provides information on the application, required equipment, the approval process, as well as guidance on operational procedures and training. All Kuwaiti registered aircraft planning to conduct steep approaches operations shall be required to obtain an approval from the Kuwait DGCA before the commencement of operations.

This guidance material is not airport specific and the principles applied could be transferred to any circumstance where steep approaches are required.

2. DEFINITION OF STEEP APPROACHES

The majority of approaches are flown at glideslope angles of 3° . Angles up to $3\frac{1}{2}^{\circ}$ are considered to be routine and within the capability of any certificated aeroplane.

Approach angles greater than $3\frac{1}{2}^{\circ}$, but less than $4\frac{1}{2}^{\circ}$, are unlikely to produce significant problems in normal operations, and accordingly there are no special requirements. Operators using these approach angles should consult the aircraft manufacturer and satisfy themselves that the performance and handling characteristics are acceptable.

Approach angles of $4\frac{1}{2}^{\circ}$ or greater are defined as steep by the Kuwait DGCA regulations, although it should be noted that ICAO applies this definition to any approach angle greater than $3\frac{1}{2}^{\circ}$. Any approach angle of $4\frac{1}{2}^{\circ}$ or greater requires specific Kuwait DGCA approval up to a maximum of $7\frac{1}{2}^{\circ}$.

[A steep approach approval is required when an obstacle clearance requirement requires an initial approach angle of $4\frac{1}{2}^{\circ}$ or greater even if the final segment is less than $4\frac{1}{2}^{\circ}$.].

3. APPROVAL OF STEEP APPROACH OPERATIONS

Approvals for Steep Approach and Landing (SAL) operations are stated in the Operations Specifications certificate issued in accordance with Kuwait Civil Aviation Safety Regulations.

Airworthiness approval for the conduct of steep approaches will generally appear in the AFM as a steep approach supplement. This supplement will specify a maximum approach angle and the limitations and operational procedures required to ensure safe approaches up to this approach angle. If no such entry is contained within the AFM it must be assumed that the aeroplane is not so cleared for Steep Approach and Landing operations.

Steep approach clearance for a particular type of aeroplane will not automatically permit all individual aircraft of that type to operate to the maximum approved angle. The clearance might require modification to existing equipment, such as GPWS/TAWS, autopilot and flight director computers. Additionally, there will likely be MEL considerations. The operator is responsible for determining the eligibility of a particular airframe in respect of the AFM Steep Approach and Landing requirements and serviceability.

4. CONSIDERATIONS AND CONCERNS FOR OPERATIONAL APPROVAL

Speed and flight path control become more demanding with increasing approach angle. The ability to track a steep approach path, especially to regain the glideslope from above, depends upon an aircraft having adequate residual throttle movement to make the necessary corrections.

Generally steep approaches may only be initiated with all engines and all systems operating normally. Consideration must be given to the procedures to be adopted in the event of an engine or system failure after commencement of the approach. This will include an engine inoperative go-around in the landing configuration. Screen height is normally 50 ft. If reduced landing distance is being sought the data must be in the AFM. There is a common misunderstanding that steep approach clearance automatically allows reduced scheduled landing performance, but this has never been the case, and short field landing is a separate certification item, regardless of the approach path. Touchdown vertical velocity should not be greater than 6 ft/sec. Tailwind limit should be 5 kt, unless test evidence has shown other figures acceptable.

In the specific case of LCY the aeroplane type must be acceptable to the Airport Director. Training approaches should be practised on PAPIS set to at least $5\frac{1}{2}^{\circ}$. An initial visit to that airport would involve an ILS approach, go-around and landing in weather conditions not less than 3 km visibility and 1500 ft cloud base. This would enable the pilot to become familiar with the local terrain. An operator's first flight into LCY with that aircraft should have a TRI qualified and current in SAL operations plus the assigned inspector on board to validate the training and hence clear the company for subsequent flights. LCY should be categorised as "C" (or equivalent) in the OM.

There are several aerodromes, both in the UK and Europe, whose approach slopes may be classified as 'steep'. While clearance into LCY would be adequate for operation into these other aerodromes, it should be remembered that the converse is not acceptable.

5. APPLICATION FOR STEEP APPROACH APPROVAL

5.1 General

Operators may apply using DGCA Form 1182 (for General Aviation Operator) and DGCA Form 1183 (for Commercial Air Transport) to fly glideslope angles of 4.5° or greater and with screen heights of less than 50 ft but not less than 35 ft.

5.2 General Aviation Operator Application

An application DGCA Form 1182 from a General Aviation operator for steep approach approval must include supporting documentation whilst also ensuring in the Compliance Declaration on the application form that the aircraft has suitably approved equipment (is eligible), the navigation database is valid, the pilot is suitably qualified and current with respect to the equipment and adequate procedures (checklists) are in place. The applicant is required to provide the following supporting documentation;

- (a) The Aeroplane Flight Manual, which must state the maximum approved glideslope angle, any other limitations, normal, abnormal or emergency procedures for the steep approach as well as amendments to the field length data when using steep approach criteria;
- (b) The MEL must reflect mandatory systems serviceability of items for steep approaches, including equipment limitations (GPWS/TAWS, flight directors etc.);
- (c) The section in the Operations Manual that contains the operating procedures and training requirements for steep approaches; and
- (d) Evidence of previous approval from ICAO Contracting State (if applicable).

5.3 Commercial Air Transport Operator Application

An application DGCA Form 1183 from a Commercial Air Transport operator for steep approach approval must include the following supporting documentation;

- (a) The Aeroplane Flight Manual, which must state the maximum approved glideslope angle, any other limitations, normal, abnormal or emergency procedures for the steep approach as well as amendments to the field length data when using steep approach criteria;
- (b) The MEL must reflect mandatory systems serviceability of items for steep approaches, including equipment limitations (GPWS/TAWS, flight directors etc.);
- (c) The Operations Manual OMA or OMB that contains the operating procedures and OMD training requirements (and suitable FSTDs) for steep approaches; and
- (d) Evidence of previous approval from ICAO Contracting State (if applicable).

5.4 Operations Manual Requirements

The following is a list of matters which must be addressed in the Operations Manual for both GA (General Aviation Operator) and CAT (Commercial Air Transport) :

- (a) Weather minima must be stated for operational and training flights for each runway to be used with a steep approach. Consideration must also be given to the following:
 - (1) State AIP VFR weather requirements
 - (2) The obstacle situation;
 - (3) The type of glide path reference and runway guidance such as visual aids, MLS, 3D- NAV, ILS, LLZ, VOR, NDB;
 - (4) The minimum visual reference to be required at DH and MDA;
 - (5) Available airborne equipment;
 - (6) Pilot qualification and special aerodrome familiarisation;
 - (7) Aeroplane Flight Manual limitations and procedures; and
 - (8) Missed approach criteria.
- (b) Description of how performance data including Regulated Take-off Weight (RTOW) is calculated.
- (c) The approach briefing should include all aspects of the steep approach, including as a minimum:
 - (1) normal and abnormal procedures during the steep approach;
 - (2) transition from a glide path reference system to a visual glide path indicating system; and
 - (3) computation of the field length data when using steep approach criteria.
- (d) Mandatory path guidance – internal, external, visual or instrument.
- (e) The terms under which single pilot operation is permitted.
- (f) The training programme.
- (g) All airports with runways requiring steep approaches should be categorised as "C" in the Operations Manual.

5.5 Training Requirements

The training requirements must be addressed in the Operations Manual for both GA and CAT. Ideally training should be conducted in an approved simulator, which the operator has determined as being suitable for its use for a particular airport.

The crew should become proficient on the task sharing, in particular regarding go-around. Both pilots should conduct at least three approaches and be trained in the procedure for both PF and PM.

An initial visit to an airport should be made and involve an ILS approach, go-around and landing in weather conditions not less than VFR for that airport. This would enable the pilot to become familiar with the local terrain.

Recurrent Steep Approach training should be performed at every LPC/OPC, and should include, as a minimum, one steep approach and, if conducted in a simulator, a second steep approach where non-normal situations are introduced during the approach.

6. CERTIFICATION

The steep approach approval will be issued on Specific Approval Certificate for General Aviation operators, a copy of which must be carried in the aircraft for all flights.

The steep approach approval will be granted by inclusion in the Operations Specifications of the AOC holder.

STEEP APPROACH OPERATION CHECKLIST

	CHECKLIST QUESTION	COMPLIANCE STATEMENT
1.	The operator has a defined declaration of weather minima for operational and training flights including acceptable headwind, cross wind and tail wind limits, gust factors, visibility/RVR requirements and cloud base.	
2.	The operators procedures for collating/ managing and verification of performance data, including obstacle clearance.	
3.	The operator's procedures for path guidance (internal, external, visual or instrument).	
4.	The operator's procedures for management of the MEL and system serviceability including GPWS, TAWS, FD, autopilot, auto-throttle, auto-thrust etc.	
5.	The operator's procedures for initial training and qualification programme, recurrent training and recency requirements.	
6.	The operator's procedures for ensuring that only qualified, competent and current crew are rostered for steep approach operations.	
7.	The operator has reviewed the AFM limitations, and this has been publicised to operating crew through training and publication.	
8.	The operator's procedure for missed approach criteria.	
9.	If applicable, the terms under which single-pilot operation is permitted.	
10.	The operator has reviewed CAT.POLA.245 and has ensured compliance.	
11.	The operator has reviewed CAT.POLA.345 and has ensured compliance.	

APPLICATION FOR STEEP APPROACH APPROVAL
(General Aviation Operator)

1. AIRCRAFT DETAILS:			
Registration Mark:			
Type/Model Designation:			
Serial Number:			
2. APPLICANT DETAILS:			
Operator:			
Nominated Coordinator:			
Telephone No:		Email:	
3. SUPPORTING DOCUMENTATION:			
<input type="checkbox"/> Proof of required equipment	Type Certificate or Supplemental Type Certificate (STC) Aircraft Flight Manual (AFM) or Supplement		
<input type="checkbox"/> MEL	Reference or proposed MEL amendment.		
<input type="checkbox"/> Previous steep approach approval	(submit with application, if available)		
<input type="checkbox"/> Operations Manual	Procedures and training section for steep approaches.		
<input type="checkbox"/> Airport 4 letter ICAO Code	Submit current approach charts.		
4. DECLARATION OF COMPLIANCE:			
Required instruments & equipment	Installed		<input type="checkbox"/>
Operations Manual (SOPs)	Procedures included		<input type="checkbox"/>
Aircraft checklists (eg. QRH)	Checklists adequate		<input type="checkbox"/>
Adequacy of maintenance	Determined to be acceptable		<input type="checkbox"/>
Training - Pilot(s)	Conducted to formal syllabus for initial/recurrent		<input type="checkbox"/>
Provision of information	Charts, publications & NOTAMs etc are adequate		<input type="checkbox"/>
5. APPLICANTS DECLARATION:			
<i>The undersigned certifies that the above items ticked indicate that the airplane systems installation, continuing airworthiness of systems, minimum equipment for dispatch, operating procedures and flight crew training comply with CAR OPS.</i>			
Name of Person responsible for Operations:			
Signature of Person responsible for Operations:		Date:	

APPLICATION FOR STEEP APPROACH APPROVAL
(Commercial Air Transport)

1. AIRCRAFT DETAILS:			
Registration Mark:			
Type/Model Designation:			
Serial Number:			
2. APPLICANT DETAILS:			
Operator:			
Nominated Coordinator:			
Telephone No:		Email:	
3. SUPPORTING DOCUMENTATION :			
Proof of required equipment	Type Certificate Aircraft Flight Manual (AFM) or Supplemental Type Certificate (STC)		<input type="checkbox"/>
MEL	Reference or proposed MEL amendment.		<input type="checkbox"/>
Previous steep approach approval	(submit with application, if available)		<input type="checkbox"/>
Operations Manual (SOPs)	OMA Reference or proposed amendment		<input type="checkbox"/>
Aircraft checklists (eg. QRH)	OMB Reference or proposed amendment		<input type="checkbox"/>
Provision of information	OMC Reference or proposed amendment		<input type="checkbox"/>
Training – Pilot	OMD Reference or proposed amendment		<input type="checkbox"/>
Airport 4 letter ICAO Code	Submit current approach charts.		<input type="checkbox"/>
5. APPLICANTS DECLARATION:			
<i>The undersigned certifies that the above items ticked indicate that the airplane systems installation, continuing airworthiness of systems, minimum equipment for dispatch, operating procedures and flight crew training comply with CAR OPS.</i>			
Name of Flight Operations Post holder:			
Signature of Flight Operations Post holder:		Date:	