



*International Civil Aviation Organization*

**Seventh Meeting of Performance Based Navigation Sub-Group  
(PBN SG/7)**

**(Virtual Meeting, 5 - 6 December 2022)**

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**Agenda Item 4: PBN Planning and Implementation in the MID Region**

**CCO-CDO PUBLICATION/CHARTING TEMPLATE**

*(Presented by CCO/CDO AD HOC WORKING GROUP)*

**SUMMARY**

This paper presents the outcomes of the CCO/CDO AD HOC WORKING GROUP on the proposed harmonized location, structure and content of CCO / CDO material in the AIP, as reviewed by the AIM SG/8 meeting and based on current good practices identified in the existing worldwide AIPs and the European CCO / CDO Action Plan.

Action by the meeting is at paragraph 3.

**REFERENCES**

- Nineteenth Meeting of the Middle East Air Navigation Planning and Implementation Regional Group MIDANPIRG/19;
- Report of the Ninth Meeting of the AIM Sub-Group AIM SG/9 ;
- Doc 9931, Continuous Descent Operations (CDO) Manual
- Doc 9993, Continuous Climb Operations (CCO) Manual
- European CCO / CDO Action Plan

**1. INTRODUCTION**

1.1 The PBN SG/6 meeting held virtually 10 – 11 November 2021, noted that a review undertaken by the secretariat revealed that current MID States AIPs does not contain details on CCO/CDO availability at airports.

1.2 The Middle East Air Navigation Planning and Implementation Regional Group MIDANPIRG/19 (Riyadh, Saudi Arabia, 14 – 17 February 2022) recognized the need for a harmonized AIP content related to CCO/CDO to ensure that identified good practices are shared and that Flight Crew / Flight Planners know where CCO/CDO-related text may be found in an AIP. Accordingly, the meeting agreed through MIDANPIRG DECISION 19/11, the establishment of CCO/CDO Ad Hoc Working Group.

1.3 The CCO/CDO Ad Hoc Working Group is established to develop guidance related to the publication of CCO/CDO information (text and Charts) in the AIP, in coordination with the relevant MIDANPIRG and RASG MID subsidiary bodies. The Ad Hoc Working Group is composed of:

- Chairpersons of the PBN SG\*, AIM SG and ATM SG
- Mrs. Sheila Brizo, (QCAA Qatar)
- Mrs. Lindi-Lee Kirkman (IATA)
- Mr. Muhammad Al Juhani (Saudi Arabia)
- Secretariat

1.4 The Ad-hoc Working Group kickoff meeting was held virtually on 12 September 2022. In addition, the rapporteur kept regular contacts with all members through the exchange of emails. The expert working group developed a harmonised AIP location (ENR1.5 for high level content and AD2.21 / 2.22 for Airport specific content), structure and content, and database coding as per ICAO Doc8168 PANS-OPS, Volume II, Part III, Section 2, and Chapter 5.

1.5 The Ninth Meeting of the AIM Sub-Group AIM SG/9 held virtually on 20 – 21 September 2022, reviewed and validated the proposed harmonized location, structure and content of CCO / CDO material with minor modifications.

1.6 This working paper recalls the provisions related to the CCO-CDO publication/charting contained in Doc 9931, Continuous Descent Operations (CDO) Manual and Doc 9993, Continuous Climb Operations (CCO) Manual and presents the recommendations of the CCO/CDO Ad Hoc Working Group on the CCO-CDO publication/charting.

## 2. DISCUSSION

2.1 ICO Doc 9993 CCO manual indicates that:

*2.1.5.2 Unless specifically required as a part of the instrument procedure design, there is no need to provide specific level windows or speed restrictions for CCO on charts.*

*2.1.5.3 Any speed and level restrictions should be clearly depicted on the chart.*

*2.1.5.4 Level restrictions should be expressed using level windows (with minimum and maximum levels), or by “at or above” or “at or below” constraints.*

2.2 In addition, ICAO Doc 9931 CDO manual specifies that:

*2.2.6.1..... The provision of distance-to-go information will provide assistance to the pilot in planning the trajectory to achieve CDO.*

*2.2.6.3 Unless specifically required as a part of the procedure design, there is no need to provide specific level windows or speed restrictions for CDO on STAR charts.*

2.2.6.4 Any speed and altitude restrictions applicable at or beyond the IAF should be clearly depicted on the chart.

2.2.6.5 Level restrictions should be expressed using level windows (with minimum and maximum levels), or by “at or above” or “at or below” constraints.

2.2.6.6 If CDO is only applicable to a part of a procedure, this should be depicted in an obvious and unambiguous manner, indicating on the chart the beginning and the end of a path where a continuous descent technique may be applied.

2.2.6.7 The CDO may be indicated with appropriate text on the chart or by the procedure designation, e.g. KARLAP (CDO).

2.3 Based on the above, the CCO/CDO AD HOC Working Group developed a proposal for the harmonised location, structure and content of CCO / CDO material in the AIP, based on the work undertaken by the European CCO / CDO Task Force.

2.4 The CCO/CDO AD HOC Working Group recommends a harmonised location, structure and content of CDO material in the AIP in order to provide ANSP’s and Aerodrome Operators with guidance on where to publish, what content to publish and the requisite information for airspace users to enable the further implementation of Continuous Descent Operations (CDO) in airspace under their jurisdiction.

2.5 The CCO/CDO AD HOC Working Group recommends that:

- A high level text on the application of CCO/CDO should be included in the ENR1.5 section of the AIP (5 - Holding, Approach and Departure Procedures); and,
- Focused CCO/CDO information including specific local information such as phraseology, the timeframe of CCO/CDO availability, the ability to fly without the prescribed altitude or speed restrictions (due to low traffic situation) etc. should be included in the AD2.21 / 2.22 sections of the AIP (Noise Abatement Procedures/Flight procedures) of individual airports.

2.6 Detailed below are the recommended AIP structure and content (together with text examples, based on existing AIP text) for harmonised AIP material on CCO / CDO.

### **2.6.1 Recommended AIP structure and content: ENR1.5**

#### ***CCO/CDO application***

In every airport, where operationally feasible, RNAV SIDs and STARs will be published in order to facilitate CCO/CDO procedures. Where the publishing of CCO/CDO procedures is not available, CCO/CDO will be provided on a tactical basis wherever possible.

Therefore, all aircraft are expected to fly a CCO/CDO profile to the extent possible. Compliance with CCO/CDO procedures is recommended provided they are compatible with ATC instructions and weather conditions are favourable.

For more detailed information for each airport, see section 2.21 and 2.22 in the AD section of each aerodrome.

### **2.6.2 Recommended AIP structure and content: AD 2.21 / 2.22**

#### ***Availability of published STAR procedures***

When the traffic situation permits and subject to ATC instructions, inbound aircraft are expected to fly a CDO profile during the hours of operation of each CDO arrival procedure to maintain as high an altitude as practical and adopt a low power, low drag, continuous descent approach profile.

Outside of the published hours of operation and if the traffic situation allows, crews can ask specifically to perform CDO profiles and to maintain the speed as appropriate to facilitate the CDOs. This authorisation will be given whenever possible outside of those hours.

*Eg. During night hours (from xxxx to xxxx), arrivals procedures in continuous descent (CDA) shall be authorised for noise abatement reasons.*

#### ***Published CDO arrival Procedures***

All published STARs can potentially be flown with a CDO profile, because STARs have mainly “at or above” altitude restrictions not forcing the aircraft to fly steady segments or to cross fixes at specified altitudes. Specified minimum procedure altitudes must be adhered unless cancelled by ATC.

The crew shall comply with speed and altitude restrictions published or provided for the destination airport, unless specifically amended by ATC.

*The above proposed content has been copied from existing AIPs and should be considered to be an example with inclusion optional, depending on local needs and requirements. Numbers and figures are examples that can be tailored to specific ATM values depending upon local conditions.*

### **2.6.3 Charting of Speed Constraint, Level Constraint and Distance-to-Go information**

An example of Speed Constraint, Level Constraint and Distance-to-Go information chart depiction is provided as appendix A to the WP.

*Note : Distance-to-Go (DTG) abbreviation should be added in the State AIP section GEN 2 with ( \* ) to indicate that this Abbreviations is not contained in, PANS-ABC (Doc 8400).*

### **2.6.4 Database coding**

*Path terminators define each segment of a PBN route from take-off until the en-route segment is joined, and from the point where the aircraft leaves the en-route segment until the end of the PBN procedure(s).The path terminators are described in detail in PANS-OPS, Volume II, Part III, Section 2, Chapter 5.*

*Continuous Climb Operations (CCO) coding:*

*Unless operational requirements dictate otherwise, procedures should use track to fix (TF) legs. Direct to fix (DF) and course to fix (CF) legs are also used to a more limited extent and may provide operational flexibility in situations where a TF leg does not meet operational requirements.*

*Continuous Descent Operations (CDO) coding:*

Unless operational requirements dictate otherwise, the following database conventions should be used:

Closed path CDO procedures: These procedures should be coded with track to fix (TF) legs and fly-by waypoints. STARs that terminate with a link to an instrument approach procedure should terminate at a fly-by waypoint. STARs that terminate with vector-based legs may be coded with fix to manual termination (FM) or heading to manual termination (VM) path terminators.

Open path CDO procedures: After the Downwind termination waypoint (DTW) an FM path terminator should be coded. If ATC requires a defined path, a VM path terminator can be used instead.

2.7 Based on the above, and to ensure that identified good practices are shared and that Flight Crew/Flight Planners should always know where CCO/CDO-related text may be found in the AIP, the AIM SG/9 agreed on the following Draft Conclusion:

***DRAFT CONCLUSION 9/4: CCO / CDO AIP PUBLICATION***

*That, the harmonized AIP CCO / CDO material and the AIP structure and content along with the Database coding at Para 2.6 is recommended to disseminate information on CCO/CDO.*

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note and review the content of this working paper; and
- b) support the AIM SG/9 meeting Draft Conclusion 9/4.