

AERONAUTICAL CHARTING FORUM
Charting Group
ACF 11-02
RECOMMENDATION DOCUMENT

FAA Control # 11-02-244

Subject:

Depicting Terrain on Departure Procedures (DPs)

Background/Discussion:

There are airfields located in close proximity to high terrain. For example, Bagram, Afghanistan (OAIX), has terrain that rises more than 6000' within 15 miles of the runway. This high terrain severely impacts the design of instrument approach and departure procedures. Although production specifications exist to depict terrain on approach procedures, there is no corresponding production specification that allows terrain depiction on departure procedures. To provide users maximum situational awareness, terrain should be depicted on departure procedures both when requested by the OPR for the DP and whenever terrain causes a climb gradient greater than 200ft/NM.

Recommendations:

Ensure specifications to depict terrain on graphic departure procedures are developed and included in IACC 7, **STANDARD INSTRUMENT DEPARTURE (SID) / DEPARTURE PROCEDURE (DP) CHARTS**, and any other applicable FLIP production specification.

Comments: This recommendation affects

US government charting specification documents

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MEETING 11-02: Mr. Daniel Lehman, USN, Naval Flight Information Group, [submitted and briefed the issue](#). Mr. Lehman went over their concern regarding the depiction of terrain on DP charts, especially with regards to DPs established in Military Areas of Operation overseas. There are airfields located in close proximity to high terrain. For example, Bagram, Afghanistan (OAIX) has terrain that rises more than 6000' within 15 miles of the runway.

This high terrain severely impacts the design of instrument approach and departure procedures. Although production specifications exist to depict terrain on approach procedures, there is no corresponding production specification that allows terrain depiction on departure procedures.

Mr. Lehman stated that the three Services are in agreement that terrain should be depicted on DP charts.

Mr. John Moore, FAA/AJV-3B, noted that DPs are not charted to scale and inquired if the three Services had a recommendation on how to depict terrain on DPs not to scale. The Services do not.

Mr. Ron Carter, FAA/AJW-353, commented that some small number of DPs are to scale and that there would be the potential to chart terrain contours on those DPs. There would be limited possibilities.

Mr. Moore commented that there are ways to put terrain on a DP plan view when not to scale, but the criteria would have to be generated, discussed and agreed to.

Mr. George Bland, HQ AFFSA, stated that one example where terrain comes close to the protected airspace is at Nellis AFB where terrain comes within 3NM of runway threshold.

Ms. Valerie Watson, AJV-3B, stated that charting terrain on not-to-scale depictions is not possible to accomplish with accuracy and should therefore, in her opinion, not be done. She further stated that there are a number of issues with depicting terrain on only DPs that are able to be charted to scale and NOT on those (with equally precipitous terrain) that are not to scale. She pointed out that pilots may make the false assumption that since no terrain is depicted on a given chart, then there is no terrain hazard within the general area depicted. The lack of standardization in the application of terrain could potentially cause user confusion and possible safety-related incidents.

Mr. Ted Thompson, Jeppesen, commented that, while approach plates generally cover an area out to 30NM from the airport and this can be depicted to scale, most standard. SIDs and STARs cover significantly larger areas and therefore have chart compression issues. Jeppesen has some more flexibility as they are able to provide fold out SIDs and STAR charts. US Government charts do not allow for such flexibility, being constrained to Size 1.

Mr. Juergen Kuhnenn, Lido, concurred with Mr. Thompson. Mr. Kuhnenn displayed an example of how Lido charts SIDs and STARs to scale and with terrain depicted. Lido does not have the compression or scale issues and utilizes folds out charts to depict the procedure.

A discussion ensued regarding the migration of the aviation community from paper products to electronic products. It was commented that with an EFB that scaling of a chart and other functional elements (use of layers to depict routes, terrain, weather, etc) can be handled vastly differently than they can be on paper.

Mr. Bruce McGray, FAA/AFS-410, commented that any changes made in depicting of terrain on the charts would add a training aspect and add greater complexity to the IR Community.

ACTION: Mr. Geoffrey Waterman, NGA and Mr. George Bland, HQ AFFSA, will work with one another to evaluate and see what procedures that their RD proposal can be applied to (considering a 200Ft/NM climb gradient) will determine if there are existing ICAO criteria and will report back at next ACF.

MEETING 12-01: Mr. George Bland, AFFSA, briefed the issue, [presenting several concept depictions](#) of terrain displayed on a departure procedure. Mr. Bland noted that in all the depictions presented, the plan view was to scale.

Mr. Ron Canter, FAA/AJV-353, restated that almost all of the FAA Departures (and Arrivals) are NOT charted to scale (being limited to the TPP-sized planview) and therefore do not lend themselves to terrain depiction.

Mr. Bland commented that within DoD's Departure program, the military charting community had a degree of flexibility not available to the FAA. For instance, they could depict the Terminal area of a DP in one scale and transitions in a different scale. Of key concern to pilots within the military community is situational awareness, particularly of rapidly-rising terrain.

Mr. Canter reiterated that the FAA is tasked with being able to fit an entire DP within the parameters of a single size-limited page and that sometimes the lateral extension of these procedures is hundreds of miles. These procedures cannot possibly be drawn to scale given today's restrictions on charting.

Mr. Bland inquired of Mr. Canter whether there was any possibility of terrain being depicted by user request for a specific procedure. Mr. Canter replied back to Mr. Bland's question with a definitive no – chart attributes (such as terrain) may not be added to FAA products counter to approved specifications.

Mr. Bland stated that the military has gone forward to establish their own criteria for charting terrain on a DPs.

The idea of adding circled “to scale” areas to Departures and the possibility of adding terrain to only these areas, was discussed. Ms. Valerie Watson, FAA/AJV-3B, voiced that before the FAA considered such action, extensive Human Factors study would need to be conducted. The possibility of users misinterpreting the data or mistaking the lack of data for the lack of precipitous terrain would need to be studied.

Mr. Bland acknowledged the differences between the charting environments and specifications between the DoD and the FAA.

Mr. John Moore, FAA/AJV-22, suggested that given that the DoD has a requirement to provide terrain information on their SIDs/DPs, that they run their concepts through the Volpe Human Factors Group. Volpe may be able to find a way to meet DoD requirements. Mr. Moore commented that the IACC would be very leery of adopting the current proposal and would require full vetting, including SMS and human factors studies.

Ms. Watson stated that at present, the FAA has not received a civil request to depict terrain appear on SIDs/DPs. The request before the Charting Forum is solely a military request and the military is free to modify their specifications to meet their customers’ needs. She stated that in her view, it is doubtful that the FAA would adopt such a change to their specifications at this time.

Mr. Brad Rush, FAA/AJV-3B, commented that the charting industry is on the verge of transitioning to electronic charting and that it may possible in the future to add many attributes that under the limitations of today’s paper products are just not feasible.

There was a consensus within the group that there is an advantage to showing terrain on SIDs and STARs but due to limitations of current chart parameters, planview size, procedure size, printing process, economic factors etc., for the FAA it is not currently possible.

Mr. Bland and Mr. Lance Christian, NGA, both understood and accepted the situation from the FAA perspective.

STATUS: CLOSED