AERONAUTICAL CHARTING FORUM
Charting Group
Meeting 16-02 – October 26 - 27, 2016

RECOMMENDATION DOCUMENT

FAA Control # ACF-CG RD 16-02-310

Subject: Inclusion of MSA for ODPs, SIDs & STARs

Background/Discussion:

Minimum Sector Altitude (MSA) information is an essential and widely-accepted component of Instrument Approach Procedures (IAPs), worldwide.

The FAA does not provide MSA information for use in either Standard Instrument Departures (SIDs) or for Standard Terminal Arrivals (STAR) procedures.

Many State aviation authorities around the world do provide MSA information for SIDs and STARs in accordance with ICAO recommendations.

Results of a recently completed but yet-to-be published study conducted by the U.S. DOT Volpe Center, titled Subjective Complexity of Instrument Procedures (Divya Chandra, Ph.D. & Rebecca Grayhem, Ph.D.), indicated a large number of professional pilots involved in the study felt it would be beneficial to include Minimum Sector Altitude (MSA) information on SID and STAR charts.

In addition to inclusion of MSA on IAPs, ICAO Annex, Aeronautical Data, Chapter 9 (SID charts, Section 9.9.3) and Chapter 10 (STAR charts, Section 10.9.3) supports the inclusion of MSA on SID and STARs. The guidance in ICAO Annex 4, Chapters 9 and 10 states identically for each: *"The established minimum sector altitude shall be shown with a clear indication of the sector to which it applies."*

The idea to include MSA on SIDs and STARs is also supported by direct feedback received by Jeppesen from professional pilots through various feedback methods. Inclusion of MSA for SIDs and STARs is also supported through direct interactions with technical pilots and representatives from a number of large, U.S.-based airlines who operate throughout the U.S. NAS and internationally.

Recommendation:

1. Expand the scope of existing TERPS criteria for the establishment of MSA for IAPs to include SID (and ODPs) and STAR procedures.

2. Include MSA information for ODPs, SIDs and STARs on applicable, official FAA procedure source documents.

3. Methods and specifications for the depiction of MSA on IAPs can and should be used in order to provide consistency between the affected terminal chart types.

Comments:

The designation of MSA for Departure and Arrival charts in the U.S. NAS would address a subject of significant interest to pilots and operators across the industry. Doing so would also address another significant subject also found to be important to pilots: Consistency.

This recommendation involves expanding the scope of existing TERPS criteria. It is not expected that new criteria for MSA would be necessary.

The depiction of MSA on IAP charts is long-established. When provided by the FAA on official procedure source documents, government and commercial chart and data providers could quickly and easily adapt and deliver the MSA information on SIDs and STARs using existing processes, methods and chart depiction specifications.

(Refer to attachments for examples.)

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Date: October 10, 2016

MEETING 17-01

Meeting was cancelled.

MEETING 17-02

John Bordy, FAA/AFS-420, stated this item has been taken to the US-IFPP, however it has not been given a high priority within that arena. He anticipates that they will address the issue at the next meeting which is scheduled to take place in January 2018. John will provide an update at the next ACF.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will report on discussions that take place at the January 2018 meeting of the US-IFPP.

MEETING 16-02

Ted Thompson, Jeppesen, briefed the recommendation. Ted stated that the basis for his submission came from the use of Minimum Sector Altitudes (MSAs) worldwide. Ted pointed out that although the International Civil Aviation Organization (ICAO) supports depiction of MSAs on Approaches, Arrivals and Departures, the FAA only provides MSA information for Approaches. Ted commented that Jeppesen has received numerous requests to provide MSAs on U.S. Obstacle Departure Procedures (ODPs), Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARs).

Ted stated that the U.S. DOT Volpe Center recently did a study titled *Line Pilot Perspectives on Complexity of Instrument Flight Procedures* on pilot behavior patterns when utilizing instrument approach procedures in the cockpit. One of the findings from the Volpe study is that pilots seek out MSA information when utilizing FAA SIDs and STARs as part of their preparation for briefing and flying the procedures. Divya Chandra, USDOT Volpe Center, confirmed this and added that MSA information is one of the very few items that pilots have ever asked to be added the charts.

As a result of the ICAO recommendations on MSAs, the Volpe study findings and direct feedback from pilots to include MSAs, Jeppesen recommends that the FAA expand the scope of the application of MSAs to ODPs, SIDs and STARs.

Lev Prichard, APA, stated that pilots often pull the MSA from the intended IAP and use the approach MSA figure as part of the briefing process for a STAR procedure. Various pilots within the room confirmed this and said the same logic/process is often used when flying SID. Ted stated that “borrowing” the MSA from the IAP is not an authorized practice and could be risky. It would be better to adapt the MSAs to the particular SID or STAR. He would like to see TERPs criteria developed and documented, and have the MSA data published on procedure source forms so that safe, reliable, FAA-supplied MSA values could be charted.

Dan Lehman, U.S. Navy, commented that the Navy depicts an MSA on the arrival procedures they develop and publish. Frank Fortunato, AFSA, stated that DoD also shows the MSA on the SIDs and STARs they generate.

Valerie Watson, AJV-553, asked the audience, considering the distances covered on many SID and STAR charts, how useful a 25 mile MSA would be.

Rich Boll, NBAA, stated that it would be useful, particularly on departures when/if a pilot encounters an emergency immediately after takeoff.

Ted pointed out that the FAA publishes MSAs on Instrument Approach Procedures (IAPs) today that can cover distances of 80 miles or more.

Gary Fisk, FAA/AJV-82, stated that he does not see a value in adding MSAs further out because pilots won’t be off the route. The only value he sees is in showing them close to the airport. Ted agreed and stated that this recommendation is to keep it to the established criteria for current MSAs.

Juergen Kuhnhenn, Lido, stated that the proposal put forward is a good one and it encourages the FAA to align with ICAO charting practices. He stated that, in response to customer requests, Lido publishes MSAs on SIDs and STARs, and if one is not published on the source, they “borrow” it from the closest aligned IAP.

Aric Newstead, Air Wisconsin, stated that their electronic chart provider, NavTech, adds the MSA on their SID and STARS, borrowing similarly from an associated approach.

Rich asked for clarification on when an MSA would be applied with regards to ODPs. Ted stated that graphic ODPs would receive an MSA under the proposal but not textual ODPs.

Divya expanded on what she and her team had observed during their study. She said that if an MSA was not published on the chart, pilots were observed looking for one. She observed them switching between related charts, distracting them from their primary task.

Tom Schneider, FAA/AFS-420, stated that since the ACF audience agrees with this proposal and as adoption of the proposal would require criteria changes, AFS-420 would take it to the U.S. Instrument Flight Procedures Panel (US-IFPP) for further consideration.

Valerie asked the audience to consider how this concept might be applied to Area STARs that serve multiple airports shown on the same chart. The depiction of multiple MSAs on a single chart would likely result in chart congestion and/or addition of an extra page. John Moore, Jeppesen, agreed and added that this topic needs more discussion before it gets to the US-IFPP. He put forth several questions that he felt should be considered: What happens with Area STARs? Would all airports get an MSA or just the primary airport? How to handle the added chart clutter? John added that the application of MSAs is easier in Europe because there is only one airport per arrival chart. John Bordy, FAA/AFS-420, said that these issues could and would be discussed at the US-IFPP.

Rich questioned the value of putting MSAs on STARs. Since within 25 nautical miles, pilots will be on the IAP. He said that showing the same MSA on the STAR would be a duplication of the MSA that is already shown on the IAP. Ted stated that are situations where the MSA on a STAR is not a duplication of the IAP MSA.

Aric commented that because pilots are now utilizing electronic flight bags (EFBs), it is more difficult to go back and forth between charts and you may not switch to the approach plate until just before being established on the approach. Therefore, having the MSA on the STAR would be of value.

Divya mentioned that this is a mental preparation issue. MSAs aid pilots in avoiding terrain particularly in unfamiliar airspace. Lev agreed and commented that pilots want that mental preparation in case something goes wrong.

Valerie reviewed where things stood at the end of the discussion. There was strong consensus within the ACF audience for the addition of an MSA on SIDs and graphic ODPs. There was mixed consensus for the addition of MSAs on STARs. It was agreed that this topic could be passed to the US-IFPP with consideration given to the concerns of the ACF audience.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will take this issue to the US-IFPP for discussion and report at the next ACF.

MEETING 18-01

John Bordy, FAA/AFS-420, reviewed the issue and provided an update. John stated that the issue was taken to the U.S. Instrument Flight Procedures Panel (US-IFPP) Departure Working Group (DWG) for consideration. The DWG will be reviewing the recommendation the first week of May. If there are no objections, it will be forwarded to the IFPP for discussion at the June meeting. He is hoping for concept approval there so that the recommendation can then move forward. John will provide an update of the outcome of the US-IFPP at the next meeting.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will report on discussions that take place at the June 2018 meeting of the US-IFPP.

MEETING 18-02

John Bordy, FAA/AFS-420, provided an update on discussions held at the last U.S. Instrument Flight Procedures Panel (US-IFPP) Departure Working Group and STAR Working Group meetings. John stated that there was very little support for adding MSAs to SIDs and STARs. They discussed the issue with industry representatives and the group agreed that the issue needed to go back to the ACM for further discussion with the larger group.

Rich Boll, NBAA, said that the US-IFPP saw this as a chart clutter issue. He said they did discuss other concept changes to MSAs for consideration. They suggested that the MSA could be changed so that it is centered on the Airport Reference Point (ARP), resulting in one MSA per airport. They also suggested allowing for sectorization on RNAV MSAs. If these changes were applied, it would allow for a single MSA per airport that could be applied to all procedures at that airport. Rich added that he supports these changes discussed.

John pointed out that these changes are not being pursued by the US-IFPP at this point but are just conceptual ideas for discussion. He said that there are disadvantages to consider with the one MSA idea as well. John added that there was not US-IFPP support for adding MSAs to STARs. He said that this item is still open in the US-IFPP and will be discussed again at the January 2019 meeting.

There was clear support expressed again in the ACM audience for charting MSAs on DPs (but not on STARs). This was the same consensus reached at the last meeting. Valerie expressed that the ACM Charting Group could not take action until support was gleaned from Flight Standards. John said that this item is still open in the US-IFPP and will be discussed again at the January 2019 meeting.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will report on discussions that take place at the January 2019 meeting of the US-IFPP.

MEETING 19-01

Valerie Watson, FAA/AJV-A250, reviewed the issue. John Bordy, FAA/AFS-420, stated that the topic had not yet been discussed at the U.S. Instrument Flight Procedures Panel (US-IFPP) because the January meeting was cancelled due to the government shutdown. He plans to get a final position from the US-IFPP at their meeting in June. John then asked if there is still ACM support for the addition of MSAs on Departure Procedures, but not on Standard Terminal Arrivals. There was strong consensus within the audience to continue working toward this goal.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will report on discussions that take place at the June 2019 meeting of the US-IFPP.

MEETING 19-02

Samer Massarueh, FAA/AJV-A221, reviewed the issue. John Bordy, FAA/AFS-420 reported that the issue was discussed at the U.S. Instrument Flight Procedures Panel (US-IFPP) and there was support for adding Minimum Sector Altitudes (MSAs) to Departure Procedures (DPs). Revised guidance is being drafted for FAA Orders 8260.46H and 8260.3E to support that change. Publication in the Orders is expected in 2020.

Valerie Watson, FAA/AJV-A250, said she will take action to write a draft Interagency Air Committee (IAC) Specification change for the addition of MSAs on DPs in anticipation of the reported Order revisions.

Rich Boll, NBAA, asked if there would be a change how the MSA is computed for DPs to allow for sectorization of RNAV MSAs. John said those changes could be discussed in the future, but for now, MSAs for DPs will be computed the same way as they are for Instrument Approach Procedures.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will report on the status of revised guidance for the addition of MSAs on Departure Procedures in FAA Orders 8260.46 and 8260.3.

ACTION: Valerie Watson, FAA/AJV-A250, will submit an Interagency Air Committee (IAC) Specification change for the depiction of MSAs on Departure Procedures, to be implemented after the revised guidance has been published in FAA Orders 8260.46 and 8260.3.

MEETING 20-02

Samer Massarueh, FAA/AJV-A221, reviewed the issue. Jeff Rawdon, FAA/AFS-420, stated that guidance has been added to FAA Order 8260.3E for the addition of Minimum Safe Altitudes (MSAs) on Graphic Obstacle Departure Procedures (ODPs) and for Standard Instrument

Departures (SIDs). Sue Walker, FAA/AFS-420, reported that the guidance has also been added to draft FAA Order 8260.46H which is in final coordination. Valerie Watson, FAA/AJV-A250, reported that she has drafted the Interagency Air Committee (IAC) Specification change for the addition of MSAs on DPs and will process it when the revised guidance has been finalized in the 8260.46.

STATUS: OPEN

ACTION: Sue Walker, FAA/AFS-420, will report on the status of revised guidance in FAA Order 8260.46 for the addition of MSAs to Departure Procedures.

ACTION: Valerie Watson, FAA/AJV-A250, will submit an Interagency Air Committee (IAC) Specification change for the depiction of MSAs on Departure Procedures once the revised guidance has been finalized in FAA Order 8260.46.

MEETING 21-01

Samer Massarueh, FAA/AJV-A223, reviewed the issue. Jeff Rawdon, FAA/AFS-420, stated that guidance has been added to draft FAA Order 8260.46H for the addition of Minimum Safe Altitudes (MSAs) on Graphic Obstacle Departure Procedures (ODPs) and Standard Instrument Departures (SIDs). He said the Order is pending signature and should be released soon. Valerie Watson, FAA/AJV-A250, reported that the Interagency Air Committee (IAC) Specification change for the addition of MSAs to Departures has been signed and will be implemented when Order 8260.46H is implemented.

STATUS: OPEN

ACTION: Sue Walker, FAA/AFS-420, will report on the status of revised guidance in FAA Order 8260.46 for the addition of MSAs to Departure Procedures.

MEETING 21-02

Samer Massarueh, FAA/AJV-A223, reviewed the issue. Sue Walker, FAA/AFS-420, reported that FAA Order 8260.46H has been published and includes the criteria for Minimum Safe Altitudes (MSAs) on graphic Departure Procedures. She said software improvements are needed before implementation can occur so a memo was issued delaying implementation until as late as fall 2022. Sue said she doesn't expect to see MSA information on charts until spring 2023, however it could happen earlier. Valerie Watson, FAA/AJV-A250, recommended closure of this item since the both the criteria and the charting specifications are in place. There was agreement to close.

STATUS: CLOSED