

AERONAUTICAL CHARTING MEETING
Charting Group
Meeting – April 24 - 25, 2019

RECOMMENDATION DOCUMENT

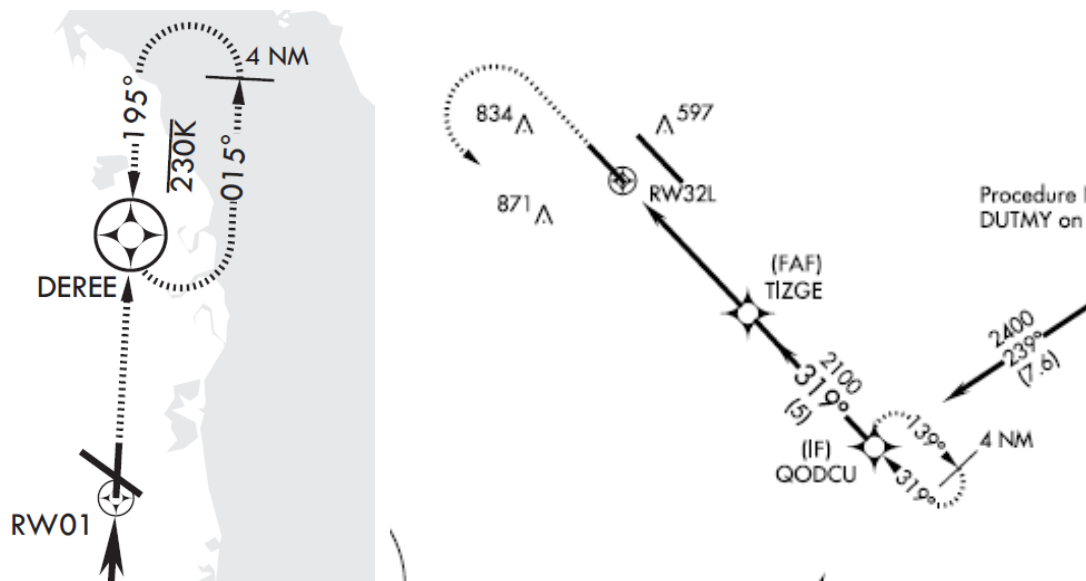
FAA Control #19-01-332

Subject: Charting Waypoints with Both Fly-Over and Fly-By Functions

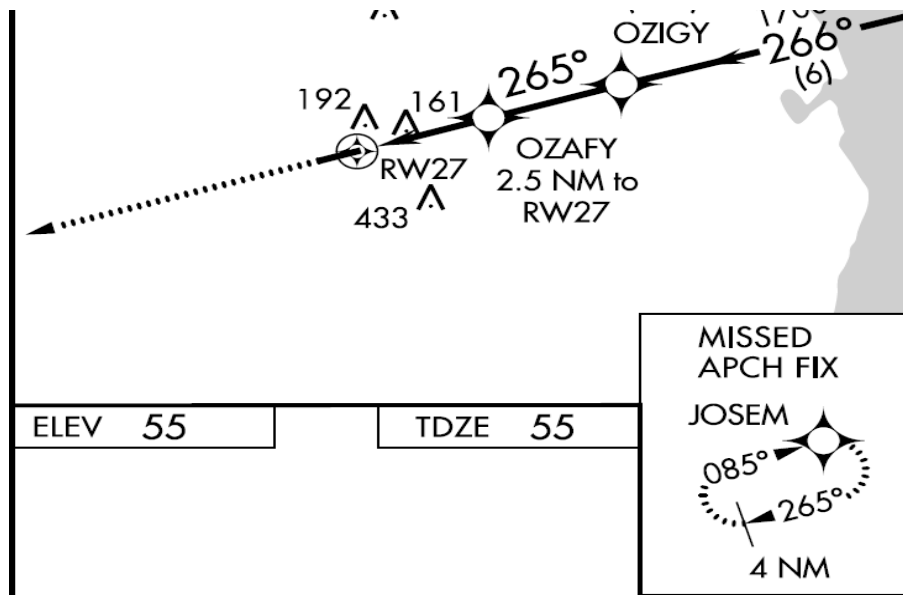
Background/Discussion:

On some GPS/RNAV Instrument Approach Procedures (IAPs) a single waypoint may function as both a Fly-By (FB) and Fly-Over (FO) waypoint. This can happen in the missed approach segment when the missed approach holding waypoint supports another segment of the approach (i.e. the Initial Approach Waypoint (IAF)). This also happens when an Intermediate Waypoint (IF)/IAF is designed with a hold-in-lieu of a procedure turn. Because of the dual usage of waypoints, there are disparities amongst the IAC charting specification, FAAO 8260.19H, and the Aeronautical Information Manual (AIM) on how a waypoint is charted as compared to how it is intended for use.

The 8260.19H currently states, “For RNAV (GPS and RNP) IAPs, and ILS/LOC procedures containing RNAV segments, document: The missed approach holding waypoint (clearance limit) as a FO waypoint. However, the missed approach holding waypoint will not be charted as a fly-over waypoint in order to avoid confusion when the fix is used for other purposes and treated as a fly-by waypoint.” This statement indicates the missed approach holding waypoint is charted as a FO if the waypoint is not used in conjunction with any other segment or is not dual use (see following examples). The 8260.19H does not direct how other holding waypoints will be designed/charted like a hold-in-lieu.



Currently the IAC states, "Waypoints designated as a holding fix will be shown as fly-by, without the circle around the symbol. However, in the event the holding fix/waypoint is also designated in some other part of the procedure (i.e., IAF) with a fly-over function, then the holding fix/waypoint will be charted as a fly-over point." This indicates that stand alone missed approach holding (which is designed as a FO) will be charted as a FB and would contradict the 8260.19H per the example below. The IAC doesn't direct how other holding waypoints will be charted like a hold-in-lieu.



The AIM currently states, "The MAWP and the missed approach holding waypoint (MAHWP) are normally the only two waypoints on the approach that are not fly-by waypoints. Fly-over waypoints are used when the aircraft must overfly the waypoint prior to starting a turn to the new course. The symbol for a fly-over waypoint is a circled waypoint. Some waypoints may have dual use; for example, as a fly-by waypoint when used as an IF for a NoPT route and as a fly-over waypoint when the same waypoint is also used as an IAF/IF hold-in-lieu of PT. When this occurs, the less restrictive (fly-by) symbology will be charted." The AIM identifies the MAHWP and MAWP as the only two waypoints not flown as a FB but doesn't provide exceptions (ie. when the missed approach holding may tie back to the IAF). This can cause confusion because review of the IAC specification and the 8260.19H would be needed for clarification. The AIM does a good job of stating the holding at a hold-in-lieu will be a fly over but the AIM is not regulatory guidance and that requirement is not written in any other regulatory guidance.

The dual designation of a waypoint is not a factor when designing an instrument procedure because they are specific to the segment. Thus the coding is not an issue for the flight management system. The problem lies in the physical charting of a waypoint when the coded procedure identifies the waypoint as both a "fly-over" and a "fly-by" designation within the instrument procedure. Since the waypoint can only be charted one way, there is an inherent disparity between a portion of navigational database and the charted procedure. This creates a challenge for the United States Air Force (USAF) because we are required to validate the navigational database by comparing it to the charted instrument procedure graphic. Per Air Force regulations, if the navigational database doesn't match the graphic, USAF crews cannot

legally fly the procedure. This guidance includes the Air Force Reserve and Air National Guard stationed at FAA core airports around the United States.

Recommendations:

Adjustments need to be made to regulations for synchronicity between charted IAPs and the navigational databases. I recommend changing the following manuals and regulations to read:

8260.19H

From-

8-6-4. Terminal routes. This information is used to develop the planview of the instrument approach chart. For RNAV (GPS and RNP) procedures, document all segments of the procedure, including the final and missed approach segments. See paragraph 8-2-5 for guidance regarding the establishment of terminal routes.

(6)For RNAV (GPS and RNP) IAPs, and ILS/LOC procedures containing RNAV segments, document:

(e)The missed approach holding waypoint (clearance limit) as a FO waypoint. However, the missed approach holding waypoint will not be charted as a fly-over waypoint in order to avoid confusion when the fix is used for other purposes and treated as a fly-by waypoint.

To-

(e)Waypoints as FB unless required otherwise for obstacle avoidance. Exception: Holding waypoints and the Missed Approach Waypoint shall be designed as FO waypoints. In the event a holding fix/waypoint is also designed in the procedure as both a FO and FB waypoint, chart the waypoint as a FB. Missed approach holding waypoints shall be charted in the Missed Approach Icon Box as a FO.

IAC

From-

Waypoints designated as a holding fix will be shown as fly-by, without the circle around the symbol. However, in the event the holding fix/waypoint is also designated in some other part of the procedure (i.e., IAF) with a fly-over function, then the holding fix/waypoint will be charted as a fly-over point.

To-

Waypoints designated as a holding fix will be charted as fly-over waypoint, with the circle around the symbol. However, in the event the holding waypoint is also designated in some other part of the procedure (i.e., IAF) with a fly-by function, then the holding waypoint will be charted as a fly-by waypoint. Missed approach holding waypoints shall be charted in the Missed Approach Icon Box as a FO.

AIM

From-

The MAWP and the missed approach holding waypoint (MAHWP) are normally the only two waypoints on the approach that are not fly-by waypoints. Fly-over waypoints are used when the aircraft must overfly the waypoint prior to starting a turn to the new course. The symbol for a fly-over waypoint is a circled waypoint. Some waypoints may have dual use; for example, as a fly-by waypoint when used as an IF for a NoPT route and as a fly-over waypoint when the same waypoint is also used as an IAF/IF hold-in-lieu of PT. When this occurs, the less restrictive (fly-by) symbology will be charted.

To-

Fly-over waypoints are used when the aircraft must overfly the waypoint prior to starting a turn to the new course. The symbol for a fly-over waypoint is a circled waypoint. The Missed Approach Waypoint MAWP will always be a Fly-over waypoint. The missed approach holding waypoint (MAHWP) will always be a Fly-over way point in the navigational database but will not always be charted as such in the event the waypoint is a dual use waypoint. Some waypoints may have dual use; for example, as a fly-by waypoint when used as an IF for a NoPT route and as a fly-over waypoint when the same waypoint is also used as an IAF/IF hold-in-lieu of PT. When this occurs, fly-by symbology will be charted even though the navigational database will identify a fly-over event in the specific portion of the procedure.

Comments:

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Date: 03/06/2019

MEETING 19-01

Kevin Keszler, AFFSA, presented the new Recommendation Document. Kevin reviewed the current FAA Instrument Approach Procedure charting practice pertaining to the depiction of Fly-over (FO) versus Fly-by (FB) status at holding waypoints. He pointed out that the Interagency Air Committee (IAC) charting specifications state "Waypoints designated as a holding fix will be shown as fly-by, without the circle around the symbol. However, in the event the holding fix/waypoint is also designated in some other part of the procedure (i.e., IAF) with a fly-over function, then the holding fix/waypoint will be charted as a fly-over point". This contradicts what is documented in FAA Order 8260.19, which indicates that the missed approach holding waypoint will be charted as a FO unless it is used as a FB on another segment of the procedure.

George Bland, USAF, said that the military charts depict the holding waypoint as FO unless it is used as FB in another part of the procedure, which is completely opposite to the FAA standard. He also pointed out that it causes confusion when the symbols do not match between the planview and the missed approach icon box.

Kevin showed the audience the current language used for waypoints from the 8260.19H, IAC Charting Specifications and the Aeronautical Information Manual (AIM), along with suggested changes to the language in all three that would support the current military standard. He pointed out that the coding of dual-use waypoints is not an issue for the flight management systems so no change there is required.

Valerie Watson, FAA/AJV-A250, commented that the current FAA charting practice has been in place for nearly 15 years and there have been no reports of pilot confusion. She explained that the current FAA process was agreed upon based on the thinking that it is unnecessary to chart these points as FO because pilots know that in establishing a hold, they are *required to fly over*

the waypoint/fix on which the holding pattern is predicated. Valerie said that the FAA does not feel it is necessary to revise over 7,000 charts to “fix” something that has not been shown to cause confusion in the pilot community. She also pointed out that in the interim period, as the 7,000 charts were in the process of being revised, there would be a mixture of contradictory depictions and that *would* cause confusion. She suggested that a more practical solution would be to clarify the guidance to ensure it supports what is currently being charted. The audience agreed.

Kevin and George both stated that they concur with the decision to not change the FAA charting standard as long as the guidance is updated to support it. This includes updates to FAA Order 8260.19 and the AIM. Kevin agreed to draft proposed language revisions to the AIM guidance and submit to Valerie, who will then coordinate with Flight Standards and the AIM office.

John Bordy, FAA/AFS-420, will work to revise the 8260.19 text to agree with the current charting standard.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will report on the status of revised guidance in FAA Order 8260.19

ACTION: Kevin Keszler, AFFSA, will draft revised text for the AIM and submit to Valerie Watson, FAA/AJV-A250 for coordination.

MEETING 19-02

Valerie Watson, FAA/AJV-A250, reviewed this issue. She first [showed the audience the language changes](#) that are being worked for FAA Order 8260.19 ([See Slide 2](#)). John Bordy, FAA/AFS-420, stated that the 8260.19 has been updated for missed approach holding patterns, but he still needs to scrub the text to ensure that the charting of all holding pattern waypoints are clearly described the same way.

Valerie then showed the audience the proposed updates to the Aeronautical Information Manual (AIM) ([See Slide 4](#)). There was audience support for the updates. Joel Dickinson, FAA/AFS-410, said that he would take the action to process the AIM revision.

Valerie then showed the proposed change to the Interagency Air Committee (IAC) Specifications. Kevin stated that Department of Defense (DoD) will take an exception to the specifications. He said military charts will continue to depict the holding waypoint as Fly-over unless it is used as Fly-by in another part of the procedure, which is opposite to the FAA standard. Valerie expressed her concern with not charting them the same way. She voiced a need for further discussions regarding adherence of both FAA and DoD to the charting specifications. She said she would take this discussion to the IAC and or IAC Point of Contact meetings.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, to update FAA Order 8260.19 to ensure all the guidance agrees with the current charting standard.

ACTION: Joel Dickinson, FAA/AFS-410, will submit the proposed updates to the Aeronautical Information Manual (AIM).

ACTION: Valerie Watson, FAA/AJV-A250, will bring the discussion of a standard waypoint depiction to the IAC to ensure the FAA and DoD concur on the charting standard for the depiction of Fly-over and Fly-by waypoints.

MEETING 20-02

Samer Massarueh, FAA/AJV-A221, reviewed the issue. Kevin Keszler, AFFSA, reported that FAA Order 8260.19, the Aeronautical Information Manual (AIM), and the Interagency Air Committee (IAC) specifications are now in alignment. He said it was decided that the IAC specifications would remain the same and the AIM and 8260.19 would be updated to ensure that the charting of all holding pattern waypoints are clearly described the same way. He reported that updated language has now been published in the 8260.19I. Joel Dickinson, FAA/AFS-410, showed the audience the [Document Change Proposals \(DCPs\)](#) to update the AIM that have been submitted and are expected to publish in summer 2021.

Rich Boll, NBAA, asked if the AIM changes say that all holding patterns will be coded as fly-over. He emphasized that should not be the case because there are instances where a fly-by is needed at a holding waypoint. Kevin stated that the AIM does not specify the holding as RNAV or conventional, but says that all holding pattern fixes will be fly-over. Rich said that the AIM language is not correct and conflicts with the recently revised holding pattern guidance.

There was a lot of discussion regarding the AIM language and the consensus was that it needs further scrutiny. Joel said he will pull the DCPs from coordination and collaborate on a revision to the proposed language and present it again at the next ACM.

Diane Adams-Maturo, FAA/AFS-420, read the new language from the 8260.19I and there was agreement that it was correct.

Jim Spencer, NGA, reported that the military has retroactively taken exception to the original IAC specification change because they plan to continue to chart the missed approach holding waypoint as fly-over in the missed approach icons when indicated. He said they will follow the specification for the charting of holding waypoints in the planview, except in a very few cases where a special request has been submitted to do otherwise.

STATUS: OPEN

ACTION: Joel Dickinson, FAA/AFS-410, will report on the status of the revised language for the Aeronautical Information Manual (AIM).

MEETING 21-01

Samer Massarueh, FAA/AJV-A223, reviewed the issue. Joel Dickinson, FAA/AFS-410, reported that he coordinated with Kevin Kessler, AFFSA, and has submitted a [Document Change Proposal \(DCP\) for the Aeronautical Information Manual \(AIM\)](#).

Valerie Watson, FAA/AJV-A250 expressed concern about the sentence “A holding waypoint will always be designated as a fly-over waypoint in the navigational database but may be charted as a fly-by event unless the holding waypoint is used for another purpose in the procedure and both events require the waypoint to be a fly-over event”. She said “**may** be charted” needs to be changed to “**will** be charted” because the holding waypoint will always be charted as a fly-by unless it is used as a fly-over waypoint on another portion of the procedure. Kevin Keszler said they felt “may” was correct since it is not hard and fast. It may be charted one way or another on military charts.

Bruce McGray, FAA/AFS-420 said he agrees with Valerie on the wording. Kevin Carter, NGA, said he also agrees with Valerie that it should be “will” and he also thinks the second portion of the change is also incorrect. The last sentence should refer to “fly-by” and not “fly-over” in that case. Krystle Kime, FAA/AJV-A222, and Valerie both voiced agreement that last sentence is incorrect. Joel said he will look into that.

Gary McMullin, Southwest Airlines, asked if on the 8260-2 form, a waypoint can be both a fly-over and fly-by waypoint depending on its use. Jeff Rawdon, FAA/AFS-420, said the 8260-2 form does not designate whether a waypoint is fly-over or fly-by. That is documented on the 8260-3 procedure form.

George Bland, USAF, said the issue arises when you try to rectify what is coded in the database with what is charted. If you are flying from the database, the procedure will tell you whether you are doing a “fly-over” or a “fly-by” because it can be coded correctly for each portion/use of that waypoint on the procedure. He said this issue only becomes a problem if a pilot is using a paper chart and not the database. Valerie agreed that the coding isn’t the problem. The problem is the paper chart where it is only possible show it one way. She said she thought it was agreed that holding would be shown as fly-by unless it was used in another function as fly-over. George said that on the DoD procedures, the fly-by/fly-over aspect of a waypoint in the missed approach icons section of the chart always matches the coding at that point, even if it is shown differently in the planview. Valerie suggested adding “in the planview” to the AIM language. Joel said he doesn’t want to make a change and is still satisfied with the original language. Kevin Keszler explained that is why they chose to put “may”. When one compares the database against the chart they will understand that there will always be exceptions because of dual use.

Valerie asked George and Kevin if the DoD follows the Interagency Air Committee (IAC) specifications for the charting of waypoints in the planview. Kevin and George both said yes. She said she is okay with leaving the word “may” in the AIM language as long as the DoD is following the specifications.

STATUS: OPEN

ACTION: Joel Dickinson, FAA/AFS-410, will report on the status of the revised language (fly-over to fly-by in the final sentence) for the Aeronautical Information Manual (AIM).

MEETING 21-02

Samer Massarueh, FAA/AJV-A223, reviewed the issue. Joel Dickinson, FAA/AFS-410, reported he submitted the Document Change Proposal for the Aeronautical Information Manual (AIM) with the correction agreed upon at the last ACM and it will be published in the 2 December 2021 edition. Valerie Watson, FAA/AJV-A250, said this issue will remain open until AIM publication is verified.

STATUS: OPEN

ACTION: Joel Dickinson, FAA/AFS-410, will report on the publication status of the revised language in the Aeronautical Information Manual (AIM).

MEETING 22-01

Joel Dickinson, FAA/AFS-410, reported that the agreed upon [revised language](#) was published in the December 2021 edition of the Aeronautical Information Manual (AIM).

Krystle Kime, FAA/AJV-A222, said she wanted to share some [examples](#) of procedures where the rules for depicting Fly-over (FO) and Fly-by (FB) are not clear for charting. She explained that in the first example, there is a holding waypoint that is designated elsewhere on the procedure as both FO and FB for reasons other than holding. She asked the audience if they would prefer that the holding waypoint be charted as FO or FB. She would like to understand what pilots would like to see in such cases and then improve the language in the specifications to ensure they are charted consistently.

Valerie Watson, FAA/AJV-A250, said it is understood that in the Flight Management System (FMS) the waypoint will be depicted as it is coded for the segment that is being flown. This question is strictly about how it should be shown on the paper chart.

Rich Boll, NBAA, said it doesn't matter how it is charted. Each FMS will depict it differently and that explanation is documented in the Aeronautical Information Manual (AIM). Bill Tuccio, Garmin, said he thinks they should be charted as FB as they are shown in the examples. He said the pilot will have been trained how to use them. Rich agreed and said it should only be charted as a FO of that is the only use of that point.

Diane Adams-Maturo, FAA/AFS-420, said FAA Order 8260.19 states the following, "Although designated as a FO waypoint in the section of the form, a holding waypoint will normally be charted as a FB waypoint. It will be charted as a FO waypoint only if it is the same waypoint designated as a FO on some other part of the procedure." Valerie said the order language would need to be changed to say something like "only if it is used as a FO in all other aspects of the procedure." If there is agreement that such waypoints should be charted as FB in these cases, the specifications and the language in the 8260.19 will need to be updated or eliminated. Krystle said she doesn't think many charts will need to be revised since she believes that most are already charted as a FB. Jeff Rawdon, FAA/AFS-420, said he thinks the Flight Procedures

and Airspace Group (FPAG) needs to take another look at the guidance in the 8260.19. He is not sure why the Order is addressing charting.

Bennie Hutto, NATCA, said that from an Air Traffic Control (ATC) perspective, he would want to give the pilot flexibility and agrees such waypoints should be charted as a FB.

John Moore, Jeppesen, said he thinks it would be confusing to show a waypoint as a FO when it is not one in all cases.

Rich said holding pattern guidance has been revised to address the fact that every FMS may handle them differently. If the fix is a FO 100% of the time it should be charted as a FO. Otherwise, it should be charted as FB. It is incumbent on pilots to understand it can be charted either way even if their FMS shows it one way. He said he would like to add an additional note in the AIM telling pilots to look at the holding pattern chapter on how RNAV systems fly holds. He thinks this should be done regardless of the results of this discussion. Rich said he will speak with Joel Dickinson, FAA/AFS-410, about that update.

Mark Mentovai, Manhattan Flight Club, asked if a new symbol could be used to convey the waypoint's joint FO/FB status. John Collins, ForeFlight, pointed out that there are 6000+ RNAV procedures that are depicted this way, so if you change anything, it will affect a lot of charts. Bill Tuccio and Rich said they do not support creating a new symbol.

Valerie summarized this group agrees with the way FO/FB waypoints are charted today. FPAG will first take a look at the 8260.19 language to determine what needs to change in the Order. After the FPAG makes their determination, Valerie will process an Interagency Air Committee (IAC) specification change to make it clear that FO waypoints will only be shown if designated as a FO (and only as FO) in all other aspects of the procedure.

STATUS: OPEN

ACTION: Diane Adams-Maturo, FAA/AFS-420, and the Flight Procedures and Airspace Group will review FAA Order 8260.19 to determine if any changes need to be made to the FO/FB waypoint guidance.

ACTION: Krystle Kime, FAA/AJV-A222, will process an IAC Specification change if/when FAA Order 8260.19 is changed to ensure the charting guidance is consistent.

MEETING 22-02

Valerie Watson, FAA/AJV-A250, shared the [proposed Interagency Air Committee \(IAC\) 4 specification language](#) for fly-over and fly-by waypoints. The new language clarifies that the only time a holding point will be charted as a fly-over point is if it is used in other aspects of the procedure and designated in all other aspects of the procedure unrelated to holding with a fly-over function. Otherwise the holding point will always be shown as fly-by. This language supports what the 22-01 audience was in favor of.

Diane Adams-Maturo, FAA/AFS-420, said the guidance in FAA Order 8260.19 will be updated to align with the change. Jeff Rawdon, FAA/AFS-420, clarified that this change doesn't affect how the waypoint is designed, documented, or coded. It is only a charting clarification.

There was then a lengthy discussion about whether or not “enroute” should be specified in the specification and criteria language. There was also a lot of discussion around whether NAVAIDs or Intersections could be designated as fly-over. It was decided that even though there are no NAVAIDs charted today as fly-over, the language should remain as proposed because it is conceivable that one could be used that way. Krystle stressed that this change is only meant to clarify what the FAA has already been doing.

STATUS: OPEN

ACTION: Diane Adams-Maturo, FAA/AFS-420, will report on the proposed changes to FAA Order 8260.19.

ACTION: Krystle Kime, FAA/AJV-A222, will report on the IAC specification change.

MEETING 23-01

Jeff Rawdon, FAA/AFS-420, reported that the guidance has now been updated in FAA Order 8260.19J, which has gone through coordination and should be signed soon.

Jennifer Hendi, FAA/AJV-A250, reported that Interagency Air Committee Specification language for fly-over and fly-by waypoints has been signed and implemented.

Bennie Hutto, NATCA, asked if a holding pattern must be selected in order to see if the waypoint is fly-over or fly-by. Rich Boll, NBAA, cautioned that each Flight Management System (FMS) treats holding differently. Even if a fix is charted as a fly-over, some FMSs will still code it as a fly-by. Charting a hold does not mean an FMS will change actions. Jennifer pointed out this this update is only a clarification for charting and does not change anything about the coding of holding waypoints.

Jennifer suggested that this item can be closed. There were no objections.

STATUS: CLOSED