

AERONAUTICAL CHARTING FORUM
Charting Group
Meeting 17-02 – October 25 - 26, 2017

RECOMMENDATION DOCUMENT

FAA Control # ACF-CG RD 17-02-316

Subject: Improving OROCA to meet FAR 91.177 Requirements

Background/Discussion:

In March 2016, the FAA tasked the RTCA Tactical Operations Committee to validate the FAA's PBN Route Structure Concept of Operations. As part of this tasking, industry and FAA evaluated the utility of information provided to pilots on Low Altitude Enroute charts. With the knowledge much of the conventional route structure would be removed over the next decade and that pilots would overwhelmingly navigate off-route using random RNAV, the RTCA committee identified a gap associated with communicating to pilots how low they can fly in areas where there are no routes.

Many low-altitude operators, particularly the helicopter and general aviation community, must fly as low as possible to remain clear of icing or because of aircraft performance limitations. The Off Route Obstruction Clearance Altitude (OROCA) is charted as a floor altitude for IFR operations as it provides obstruction clearance; however, the FAA provides a disclaimer in the Instrument Procedures Handbook:

“OROCAs are intended primarily as a pilot tool for emergencies and SA. OROCA depicted on en route charts do not provide the pilot with an acceptable altitude for terrain and obstruction clearance for the purposes of off-route, random RNAV direct flights in either controlled or uncontrolled airspace.”

The RTCA committee noted that OROCA would become more important in the future as more published routes are decommissioned and as random RNAV operations increase. Ensuring pilots have a means to verify their minimum altitude, such as in cases of lost communication, will be increasingly important.

The ACF Point-to-Point Subcommittee, established at ACF 16-02, discussed the RTCA proposed solution which was to replace OROCA with a Grid Minimum IFR Altitude (MIA). No consensus was reached to bring this concept forward to ACF; however, consensus was reached that OROCA's deficiencies must be addressed. The subcommittee felt that the FAA must provide pilots with the information necessary to comply with FAR 91.177 which could be accomplished by improving OROCA.

Reviewing [IPG 96-01-155](#), the original request from ALPA to have OROCA be an altitude approved for operations, it is clear there are several concerns with utilizing OROCA as an altitude Air Traffic Control (ATC) could clear a pilot to. ATC does not use the OROCA for off-route altitude assignments, rather they use an MIA or other approved air traffic altitude. The subcommittee believes we should not change this practice and that this recommendation should have no impact on ATC operations. The subcommittee understands OROCA is generally similar to the MIA despite OROCA not factoring in controlled airspace, communication, etc. Pilots

would utilize OROCA for off-route flight planning purposes to ensure they comply with FAR 91.177 and for emergency situations where they may need to fly at that minimum altitude.

Those concerns identified by the Instrument Procedures Group with the 1996 ALPA recommendation, and the other OROCA issues identified by this subcommittee, are listed below along with the subcommittee's rebuttal.

1. Continuous evaluation must be provided for the OROCA via the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) program under Order 7400.2.

The FAA does not check for the impact temporary or permanent obstructions have on an OROCA value in between charting cycles. The OROCA value is updated on the 56-day cycle with no changes or notices published in between cycles. It is critical for pilots to have useful information for flight planning to determine compliance with FAR 91.177. This regulation notes that absent a Part 95 or Part 97 altitude, pilots must comply with 2,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown for mountainous and 1,000 feet for non-mountainous. The OROCA provides this as the chart note states "OROCA provides obstruction clearance with a 1000-foot buffer in designated non-mountainous areas and a 2000-foot buffer in designated mountainous areas." However, the impact of off-cycle obstructions is currently not known because OROCA is not part of the OE/AAA process. Incorporating OROCA into the OE/AAA process is fundamental to improving this product and providing pilots the assurance they need that they are complying with FAR 91.177.

2. A NOTAM policy must be developed to promulgate off-cycle OROCA changes.

For OROCA to be of operational value to pilots and to assure compliance with FAR 91.177, there must be a process to alert pilots of OROCA value changes. The FAA has processes in place to ensure NOTAMs are published for changes to route values. The FAA also has a process in place to alert controllers of MIA changes due to new obstructions. Pilots must be alerted when the OROCA value changes so that they can understand the impact on their required minimum altitude compliance.

3. OROCA use should be coordinated through the FAA's Office of the General Counsel (AGC) to determine if the OROCA satisfies FAR 91.177 and whether it should be placed under Part 95.

The subcommittee does not believe OROCA needs to fall under Part 95 as OROCA is in direct response to FAR 91.177 and this value will not be utilized by air traffic; it is information for pilots. We do not believe coordination with AGC is warranted. The OROCA value provides the altitude clearance required by FAR 91.177; however, the values are currently not updated in between cycles and those changes are not communicated to users (via NOTAM). This creates the issue of the OROCA being out of date as soon as it is published as pilots cannot be sure that they are complying with FAR 91.177. The subcommittee believes AGC's concerns will be addressed by the resolution of the other OROCA issues, namely OE/AAA and NOTAM policy.

4. The existing OROCA grid size is too large to be of value.

The subcommittee discussed the granularity of the grid size (1 degree x 1 degree in CONUS) and found consensus that the existing grid size works as it does not overload

the pilot and is comparable to the Grid MORA. The subcommittee did see a benefit in changing the Alaska OROCA grid size (Alaska is currently 2 degrees x 2 degrees) to be reduced to the same size as CONUS. Alaska stakeholders provided input and saw value in their grid being smaller because the high terrain has a significant impact on en route altitudes.

5. Controller and pilot guidance must be updated.

Once OROCA is supported by the FAA as an altitude that assures compliance with FAR 91.177, pilot guidance would need to be updated in the AIM and Instrument Procedures Handbook to inform pilots. ATC would continue to use other values when clearing pilots so their guidance would not need to change nor the way they operate. The pilot's guidance would continue to address the pilot's expectation of altitude clearance and differentiate that OROCA is not an altitude ATC would clear an aircraft to except incidentally. Furthermore, the ATC cleared altitude may be higher or lower than the OROCA value.

Recommendations:

1. The FAA should provide for the continuous evaluation of OROCA values via the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) program under Order 7400.2.
2. The FAA must issue NOTAMs for those OROCA values that change off-cycle. These NOTAMs should be associated with an ARTCC and identify the impacted grid square using lat/long.
3. The existing OROCA grid size should be maintained for CONUS and the Alaska grid size should be changed to be the same size as CONUS (1 degree x 1 degree).
4. The FAA should update the AIM and Instrument Procedures Handbook to inform pilots that OROCA values assure compliance with FAR 91.177 but are not an altitude ATC will clear an aircraft to fly except incidentally.

Comments:

While investigating the options pilots have today to determine FAR 91.177 compliance, the subcommittee identified the issue that NOTAMs are not issued for temporary obstructions that do not impact an airway or instrument approach but that may impact a pilot's requirement to fly 2,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown for mountainous and 1,000 feet for non-mountainous. There is no method available to a pilot today to use FAA products and determine they meet FAR 91.177 compliance should they fly off-route because no notice is provided to the pilot of a temporary obstruction. The subcommittee does not desire each temporary obstruction to warrant the issuance of a NOTAM as we believe a single NOTAM, at most, for each OROCA grid value would efficiently resolve this issue and communicate to pilots their FAR 91.177 compliance altitude. The lack of a NOTAM for temporary obstructions impacts the Maximum Elevation Figure (MEF) provided on Sectional charts and other charting products and mechanisms.

The non-FAA organizations that support this Recommendation Document:

Aircraft Owners and Pilots Association
(AOPA)
Alaska Airmen Association (AAA)
ForeFlight

Helicopter Association International (HAI)
Jeppesen
National Business Aviation Association
(NBAA)

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Date: 7 April 2017

MEETING 17-02

Rune Duke, AOPA, [presented this recommendation](#). Rune explained that with the ongoing transition to a Performance Based Navigation (PBN) National Airspace System (NAS) where much of the ground-based route structure is being removed, there is a going to be an increasing need for off-route safe altitudes. He described the FAR 91.177 requirements and stated that there is a need to address the gap between those requirements and what is being provided to pilots. Rune's Point-to-Point Navigation working group has been meeting since the last ACF and in talking about this issue, they are pursuing the use of Off Route Obstruction Clearance Altitudes (OROCA) for use as minimum flight altitudes. However, in order for OROCA to be used for navigation, several issues must first be addressed. Rune then went over his specific recommendations with regard to OROCA.

1. Continuous evaluation of OROCA values via the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) program.
2. A NOTAM policy must be developed for off-cycle OROCA changes.
3. The Alaska OROCA grid size (currently 2°x 2°) should be changed to be the same as the CONUS (1°x 1°).
4. The FAA should update the AIM and Instrument Procedures Handbook to inform pilots that OROCA values assure compliance with FAR 91.177 but are not an altitude to which ATC will clear an aircraft to fly except incidentally.

Valerie Watson, FAA/AJV-553, stated that the Enroute charting group has investigated changing the grid size in Alaska to be the same as the CONUS and have determined that it can be accomplished. She said that they will continue to work this initiative and will advise when it can be implemented.

Rich Boll, NBAA, commented that under current regulations and operations, the pilot is legally responsible for off-route navigation, however he points out that the FAA is not providing NOTAMs for temporary obstacles. John Bordy, FAA/AFS-420, explained that there is an obstacle reporting requirement through the OE/AAA process so the FAA does have the obstacles, temporary and permanent, but only evaluates them for their effect on flight procedures and airways, not OROCAs. He believes that FAA Order 7400.2 would have to be modified if it is necessary that all obstacles affecting OROCAs are to be published via NOTAM.

Valerie pointed out that AJV-5 currently runs a tool every 56 days to determine changes to the published OROCA values on FAA Enroute charts. She suggested that her organization could look into the possibility of running that program daily. It was pointed out that the OROCA program currently used does not account for temporary obstructions. Valerie suggested that AJV-5 look into how Minimum IFR Altitude (MIA) and Minimum Vectoring Altitude (MVA) values are calculated for ATC use and determine whether the same pool of obstacles could be used for a daily AJV-5 assessment of OROCA values. Rune agreed that if the same process could be used for the calculation of OROCA values as is currently used for MIA and MVA assessment, that would be sufficient. There was general agreement by the audience.

NOTAM authority and the process for publication of OROCA changes occurring between chart cycles was then discussed. Lynette (Jamison) McSpadden, FAA/AJR-B11, said that if these were published as FDC NOTAMs, they would be promulgated by Oklahoma City. If they are determined to be Center-driven, then they would be initiated by the Operation Support Groups (OSGs). Valerie said that her offices would work with the NOTAM office to determine a process for the publication of OROCA NOTAMs.

Valerie then mentioned that the Enroute chart legend panels contain a textual description of OROCA and that if that text is to be changed, AJV-5 would need to receive revised descriptive text from appropriate authority.

STATUS: OPEN

ACTION: Brian Murphy, FAA/AJV-562, will investigate how MIA and MVA assessment is done (using what obstacles) and determine if the same can be applied to the AJV-5 OROCA assessment.

ACTION: Brian Murphy, FAA/AJV-562, will investigate the feasibility/possibility of running the modified OROCA tool on a daily basis vs every 56-days.

ACTION: Valerie Watson, FAA/AJV-553, will work with the Lynette (Jamison) McSpadden, FAA/AJR-B11, to determine what would potentially be the process for publication of NOTAMs for OROCA changes.

ACTION: Valerie Watson, FAA/AJV-553, will draft a specification change to accommodate revision of the existing Alaska grid size to match CONUS (1° x 1°).

MEETING 18-01

Valerie Watson, FAA/AJV-553, reviewed the history of this recommendation. Valerie stated that since the last meeting, she drafted and received approval for a specification change to support the revision of the existing Enroute Low Altitude Alaska Off Route Obstruction Clearance Altitudes (OROCA) grid size to match that in the lower 48 (1° x 1°). This change will be implemented on the July 19, 2018 effective date Alaska Low Altitude Enroute charts.

Bryan Murphy, FAA/AJV-562, then discussed his investigation into how Minimum IFR Altitude (MIA) and Minimum Vectoring Altitude (MVA) assessments are done to see if the same can be applied to the OROCA assessment. He said AJV-5 does have access to the MIA and MVA obstacles files and his office is looking into options that will accommodate the request that

OROCA assessments be made using the same obstacle pools used in MIA/MVA assessment. He stressed that AJV-5 will also have to consider the labor and cost associated with the work before committing to pursue this endeavor.

Tony Lawson, FAA/AJV-553, stated concerns regarding whether or not this data would be accurate and timely enough for instrument flight and whether or not NOTAMs can be written on the OROCA values. Brian said they are still looking into the possibility of running the OROCA calculation every day versus every 56 days. Valerie said that she has been looking into the NOTAM piece, but said that it's difficult to determine how that will be handled when we don't know yet if or how we will accomplish this goal.

Valerie questioned what office owns the definition for OROCA and voiced that if this project moves forward and OROCA may be used for off-route IFR flight, the OROCA explanatory language that is printed on the enroute charts will need to be revised. She asked that FAA/AFS-420 look at how this definition should be changed. John Bordy, FAA/AFS-420, said that once the other questions are answered and it is determined that we are moving forward with this recommendation, then AFS-400 can work on this language as well as explanatory language for the Aeronautical Information Manual (AIM) and Pilot Controller Glossary (PCG).

Rune Duke, AOPA, stated that he is happy with the Alaska grid size update. He stressed that with the impact of the VOR MON program, this issue is becoming more important, but said he understands that this is a long-term effort and is appreciative of the efforts made thus far.

STATUS: OPEN

ACTION: Brian Murphy, FAA/AJV-562, will continue to investigate using the MIA and MVA assessment for the development of a new OROCA assessment.

ACTION: Brian Murphy, FAA/AJV-562, will continue to investigate the feasibility of running the modified OROCA tool on a daily basis vs every 56-days.

ACTION: Valerie Watson, FAA/AJV-553, (if/when the above have been determined to be feasible) will work with the Lynette Jamison, FAA/AJR-B11, to determine what would potentially be the process for publication of NOTAMs for OROCA changes.

ACTION: John Bordy, FAA/AFS-420, (if/when the above have been determined to be feasible) will work to determine and publish OROCA definition and sanctioned use.

MEETING 18-02

Valerie Watson, FAA/AJV-553, briefed the issue. Brian Murphy, FAA/AJV-562 discussed his investigation into Minimum IFR Altitude (MIA) and Minimum Vectoring Altitude (MVA) assessments and he reported that the current Off Route Obstruction Clearance Altitudes (OROCA) assessment is already using the same data as the MIA and MVA assessments. He said the OROCA tool could be run on a weekly basis, however, his concern is that there is not yet a system in place for the publication of NOTAMs for OROCA changes.

Valerie asked if running the OROCA assessment weekly would be sufficient. Rune Duke, AOPA, said that is acceptable.

Valerie then asked John Bordy, FAA/AFS-420, if he could begin work to determine and publish a revised OROCA definition and sanctioned use. John said that he will work with the Flight Operations Group on that piece. He then asked if anyone is looking into if the Obstruction Evaluation/Airport and Airspace Analysis (OE/AAA) Program should have a role or if the Obstacle Evaluation Group (OEG) can provide notification of obstacles. John stated that he will look into those questions to see if either is feasible. Valerie commented OE/AAA program may not be needed because that level of detail is not necessary with the large buffer that is built into the OROCA values.

Valerie then discussed NOTAMs. If the OROCA values are to be sanctioned for off-route safe flight altitudes (and this will depend on the formal definition/use wording that Flight Standards develops and stands behind), any changes to the values, though they happen infrequently, will need to be updated via NOTAM. That NOTAM process and office of responsibility for OROCA changes still needs to be determined. Valerie said that after the Flight Standards piece is accomplished (definition and use of OROCA for off-route safe flight), she and Lynette McSpadden, FAA/AJR-B3, will work on NOTAM publication details.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420, will work to determine and publish a revised OROCA definition and sanctioned use.

ACTION: John Bordy, FAA/AFS-420, will investigate the need to include the OE/AAA program in the OROCA obstacle evaluation process.

ACTION: Valerie Watson, FAA/AJV-553, will work with Lynette McSpadden, FAA/AJR-B3, to determine the process for publication of NOTAMs for OROCA changes after the Flight Standards definition has been established.

MEETING 19-01

Valerie Watson, FAA/AJV-A250, reviewed the history and actions associated with the issue. She asked John Bordy, FAA/AFS-420, to brief his efforts to determine a revised Off-Route Obstruction Clearance Altitude (OROCA) definition and sanctioned use for flight planning purposes assuring compliance with 14 CFR, Part 91.177. John responded that many questions remain before that can be accomplished. He stated that he is still concerned that there is a need to include the Obstruction Evaluation/Airport and Airspace Analysis (OE/AAA) Program in the OROCA obstacle evaluation process. He said there are FAA documents such as the FAA Order 7400.2 and 14 CFR Part 77 that would need to be updated in order to ensure OROCA is on the list of items that are evaluated by OE/AAA.

Rune Duke, AOPA, stated that he was under the impression that it had already been decided that OROCA evaluation does not need to be part of the OE/AAA process, based on the fact that OROCA assessments use the same data as Minimum IFR Altitude (MIA) and Minimum Vectoring Altitude (MVA) assessments. If the OROCA assessment is using the same data and is updated on a weekly basis, this should be sufficient.

Rich Boll, NBAA, pointed out that even if a pilot is using an OROCA, they still have an assigned MIA/MVA and are still covered by Air Traffic Control.

After more discussion, it was clarified that inclusion of OROCA under the current OE/AAA process is not currently being requested. A Flight Standards determination is being requested to determine if the Aeronautical Information Manual (AIM), Instrument Procedures Handbook and the charted OROCA text may be revised to indicate that an OROCA can be used for flight planning purposes to assure compliance with 14 CFR, Part 91.177. The determination should be based on the assumption that OROCA is not protected by the current OE/AAA process, but that the OROCA assessments are run on a weekly basis and an OROCA NOTAM capability exists. John said he would work with John Blair, FAA/AFS-410, and others in Flight Standards to make that determination. If/when this determination is made, work will begin between AJV-A and the NOTAM Policy Office to establish the NOTAM process to update weekly OROCA assessments.

STATUS: OPEN

ACTION: John Bordy, FAA/AFS-420 and John Blair, FAA/AFS-410, will obtain a Flight Standards determination regarding allowing the use of OROCA values to assure compliance with 14 CFR Part 91.177, Minimum Altitude for IFR Operations.

MEETING 19-02

Samer Massarueh, FAA/AJV-A221, reviewed the issue. Joel Dickinson, FAA/AFS-410, provided an update. He stated that his office does not believe that OROCA can be used to satisfy FAR Part 91.177. They are however, working to revise the Instrument Procedures Handbook (IPH) and Aeronautical Information Manual (AIM) guidance for how pilots can use OROCA. He said they expect the new guidance to be published by the next ACM.

Rune Duke, AOPA, stated that though this is a compromise to what was originally requested, he agrees that this course will likely lead to a solution that will work. He supported Joel in that the wording of the OROCA language is still under discussion.

Gary Fiske, FAA/AJV-82 Contract Support, expressed his concern for Air Traffic Control (ATC) to know what the minimum altitude is that they can assign. Rune responded that the limits will be clear and the work being done will not change ATCs processes or change how pilots file flight plans.

Valerie Watson, FAA/AJV-A250, stated that the OROCA guidance published on the [FAA Enroute Low Charts](#) will also need to be revised along with the AIM and IPH. Joel and Rune agreed that the charted definition of OROCA and its use will be addressed.

STATUS: OPEN

ACTION: Joel Dickinson, FAA/AFS-410, will report on the status of revised OROCA guidance to be published in the Instrument Procedures Handbook (IPH), Aeronautical Information Manual (AIM), and on the FAA Enroute Low Charts.

MEETING 20-02

Samer Massarueh, FAA/AJV-A221, reviewed the issue. Joel Dickinson, FAA/AFS-410, provided an update. He said his office has improved the wording for the Aeronautical Information Manual (AIM) describing how OROCA can be used. He reiterated that his office's position is that OROCA cannot be used to satisfy FAR Part 91.177. Joel shared [slides](#) that contain the revised language for the AIM, the FAA Enroute Low Chart OROCA note, and for the Instrument Procedures Handbook (IPH).

Valerie Watson, FAA/AJV-A250, asked Joel if there is a change to how a pilot will use OROCA. Joel emphasized that they have not changed the definition of OROCA or how it is calculated, but are trying to clarify what OROCA is so that pilots will better understand how it can be used.

Valerie asked for input from AOPA, the original proponent of this item, if they support the direction that the Flight Operations Branch has taken. Jim McClay, AOPA, said that this is the first time he has seen these changes so he will need to look at it more closely. Joel said that this is the first time it has been shared with a larger audience.

Valerie said that with these proposed changes, it appears that there will not be a need to pursue updating the OROCA values with more frequency than the current 56-day updates or a need to publish NOTAMs on interim cycle changes. Joel confirmed that the frequency of updates will not change and interim NOTAMs will not be necessary.

Bruce Williams, Bruce Air, said that he is still concerned about how OROCA will be used when planning an off-airway route. Joel emphasized that a pilot will never be given an off-route clearance without being given an ATC assigned altitude. Rune Duke, FAA/AJI-314, stated that there was a lot of collaboration in the workgroup to draft this revised language. He emphasized that OROCA is not an altitude that ATC uses, but it is there for flight planning and for contingency use. Bruce emphasized the importance of explaining this adequately in the pilot guidance. Rich Boll, NBAA, agreed that this was a collaborative effort and said that the revised guidance for the IPH addresses Bruce's concerns.

Joel stated that his office will move forward with the Document Change Proposal (DCP) process for these proposed changes. Valerie asked how long it will take for publication and whether or not she should move forward with the changes to the OROCA text published on the Enroute Low Charts. Joel said it takes two AIM cycles before the guidance is published so he recommends waiting until that is complete before proceeding with the chart change. John Blair, FAA/AFS-410, emphasized that the DCP still needs to be coordinated which can result in some changes to the language.

STATUS: OPEN

ACTION: Joel Dickinson, FAA/AFS-410, will report on the status of revised OROCA guidance to be published in the Instrument Procedures Handbook (IPH), Aeronautical Information Manual (AIM), and on the FAA Enroute Low Charts.

ACTION: Valerie Watson, FAA/AJV-A250, will submit an Interagency Air Committee (IAC) Specification change amending the OROCA text on IFR Enroute Low Altitude charts after receiving the sanctioned text from Joel Dickinson, FAA/AFS-410.

MEETING 21-01

Samer Massarueh, FAA/AJV-A223, reviewed the issue. Joel Dickinson, FAA/AFS-410, reported that the revised guidance in the Aeronautical Information Manual (AIM) and on the FAA Enroute Low Charts have been submitted for publication. Valerie Watson, FAA/AJV-A250, reported that the Interagency Air Committee (IAC) Specification change amending the OROCA text on IFR Enroute Low Altitude charts will be published on the 12 August 2021 effective date.

All actions have been completed and there was agreement to close this item.

STATUS: CLOSED