Discontinuation of VOR Services

Meeting 11-02

Mr. Ken Ward, FAA/AJW-911, provided an update on the FAA's plans to decommission over 400 VOR NAVAIDs by 2020. Mr. Ward briefed on the analytical work associated with insuring that sufficient VOR services that remain to support would the NAS. Early estimates show that 50 to 60 VORs per year would need to be decommissioned to meet the 2020 deadline.

Mr. Ward stated that a Federal Register notice which announces the elimination of VORs from the NAS, was close to being approved, awaiting for the NextGen Management Board's sign off.

Criteria is being worked on the how the FAA will evaluate VORs that currently in use to determine which can safely be decommissioned and which will need to remain operational.

Mr. Ward did not have any guidance regarding timelines for the decommissioning or for the establishment of any working groups, both within the FAA and with the aviation community.

Mr. Paul Eure, FAA/AJE-31, stated that Enroute, to date, had not been included in any discussions, meetings, etc., on the subject and have had to inject themselves into such proceedings. Mr. Eure expressed his concern regarding the lack of involvement of both Enroute and Terminal organizations in the coordination process. Mr. Eure noted that ATC Facilities should be given time and resources to be able to be engaged in the VOR analysis process to insure service and safety to users of the NAS.

ACTION: Mr. Ken Ward, FAA/AJW-911, will notify the Chair of ACF-Charting Group should a briefing be warranted at the next ACF.

Meeting 12-01

Mr. Ken Ward, FAA/AJW-911, provided an update on the FAA's plans to decommission over 400 VORs by 2020. Mr. Ward briefed that a Federal Register notice of proposed policy and request for comments was published on December 15, 2011 (Available on line at https://federalregister.gov/a/2011-31451). The comment period ended on March 7, 2012. A subsequent Federal Register notice is due out within the month of May encompassing the comments submitted.
Work continues on the process by which the FAA will evaluate VORs currently in use to determine which can safely be decommissioned and which will need to remain operational.

Mr. Ward stated that the overall plan briefed at the last ACF remained unchanged, with the projected number of VORs decommissioned remaining at or about 450. The number of DMEs in the NAS will not diminish, but is expected to drastically expand. The total number of required DMEs anticipated is as yet undetermined.

A lengthy discussion ensued, during which Mr. Paul Eure, FAA/AJE-31, mentioned his concern that the current Standard Service Volume (SSV) for VORs of 40 NM, compared with the 77 NM proposed, may cause problems. It was also discussed how the decommissioning of a large number of VORs would impact GA, how the FAA would insure the continuation of a sufficient number to insure safety, etc. The issue presents major challenges with regards to the redefinition of SSVs, routes, fixes, airspace, flight

inspection, DME/DME/IRU reassessment, etc. and the associated costs incurred in making these changes.

Mr. Ted Thompson, Jeppesen, inquired as to budget implications for the FAA in defining fixes/airspace/procedure issues presented by the proposed migration to NEXTGEN. What are the costs associated with the charting changes that these actions will incur? Has the FAA planned and established cost projections for these changes?

Mr. Brad Rush, FAA/AJV-3B, responded that AeroNav Products is in the process of attempting to assess the cost impact, but that until detailed transition plans are received, this is not possible.

Mr. Thompson stated that the issue for commercial charting entities is the resources necessary to handle a large volume of changes to charts, procedures and database programming.

ACTION: Mr. Ken Ward, FAA/AJW-911, will notify the Chair of ACF-Charting Group should a briefing be warranted at the next ACF.

Meeting 12-02

Ken Ward, Contractor, FAA/AJM-324, provided a general overview of the activities within the FAA toward establishing a plan for the discontinuation of VOR services as part of the overall migration to NEXTGEN IFR Infrastructure. Ken had prepared a PowerPoint which was not able to be shown during the briefing, but is included here. He reported that the program charter is still a work in progress. On August 21, 2012, the FAA released an item in the Federal Register – Next Generation Air Transportation System Transition to Performance Navigation, Federal Register Document No. 2012-20464. The Federal Register posting is the FAA's response to the public comments received per Federal Register Notice 76 FR 77939 posted on December 15, 2011.

Various industry members within the audience expressed concern over the perceived lack of coordination both within the FAA and with industry regarding the actual implementation of the plan to decommission VORs. Ken emphasized that a plan had not been fully developed, but was a work in progress. The general consensus from the discussion was that industry needs to be involved and have input **before** an FAA plan reaches maturity.

Deborah Miller-Adams, FAA/AJM-324, took several questions from various industry representatives and emphasized that the FAA is working to prepare itself for industry involvement in the migration to NEXTGEN. Deborah assured all the industry representatives that the FAA fully intends to have the industry involved and engaged in the migration process.

ACTION: Deborah Miller-Adams, FAA/AJM-324, (or a designated representative) will provide a briefing at the next ACF.

Meeting 13-01

JoAnn Ford, Acting Manager for AJW-41, presented an updated briefing and overview of the Very High Frequency Omnidirectional Range (VOR) Minimum Operation Network (MON) Implementation Program.

JoAnn introduced the project's Acquisition Management Systems (AMS) Project Manager, Ernesto Etienne, AJM-324.

JoAnn reviewed the overall plan of the systematic decommissioning of approximately half of the VORs within the NAS. JoAnn emphasized that there would still be VOR coverage at or above 5000 feet AGL, the remaining VORs having a service volume (SV) of 77nm. Work is being done now to assess and insure that the SV target is being met. The objective is to transition from the current VOR-based NAS to a RNAV-based NAS by 1 January 2020, at which time the VOR MON will have been fully tested and vetted.

JoAnn stated that the list of candidate VORs for shutdown is being vetted internally within the FAA. She emphasized that this process is ongoing and the list will continue to change as the FAA works through the transition process.

Greg Pray, AJV-211, expressed concern on the vetting process, stating that there are many public/private parties who will want to voice their concerns. He inquired to whom those parties should get in touch with about their concerns. JoAnn stated that Deborah Lawrence, AJM-321, is the best point of contact for such concerns.

Ray Lewis, USN, inquired about the process for VORs that are maintained by the FAA but are not part of the NAS, such as those in the Bermuda/Caribbean area.

Paul Eure, AJE-31, responded that the VORs in the Bermuda/Caribbean area are governed by various treaties and involve the U.S. State Department. Those VORs are not included in the current discussion.

John Collins, GA Pilot, asked whether there are plans to shutdown VORs on which Class B airspace areas are predicated and if so, how that would be handled.

Paul responded that various airspace classification definitions are a topic of discussion and are included in the ongoing evaluation of which VORs are critical.

Lucy Kruse, AJV-3C, asked if there was a separate subordinate program to look at VORs reaching their end-of-life service. She expressed her concern that all factors associated with VOR NAVAID facility shutdown are being taken into account. She inquired whether the ongoing discussions included the possibility of boosting the remaining VORs with Doppler kits or whether a cost assessment has been done on demolition of the VORs identified for decommissioning.

Paul responded, stating that there are teams working these issues. Paul emphasized that given the time line for the transition of the NAS to a PBN environment, there are a lot of issues that have to be taken into account and coordinated, while maintaining current NAS air traffic flow capabilities. The details of the plan are still solidifying and in the coming months and years, these decisions will be made. Paul added that currently, the sequestration cuts are having an impact on the availability of resources

available within the FAA to address the challenges raised by this transition. Paul reassured the audience that there will be opportunities for organizations both within and outside of the FAA to comment and contribute to the plan that is evolving.

JoAnn commented that LPV is being put in place of VOR approaches where VORs are discontinued. Additional costs are being looked at and evaluated.

Bill Hammett, Contract Support, AFS-420, inquired as to whether there had been any thought about lowering the floor of controlled airspace to 1,200 feet AGL in the Western U.S. and the upper peninsula of Michigan? This action would greatly reduce the amount of rulemaking to support new instrument procedure development and RNAV routes.

Bob Lamond, NBAA, commented that NBAA supports this initiative and has submitted a request for rule-making regarding the proposal.

John Collins inquired if the issue regarding VOR name retention was being discussed. Paul replied that one approach being looked at and receiving support was to allow VOR name retention for a stand-alone DME at the same location.

JoAnn commented that another thing being looked at was how Hazardous Inflight Weather Advisory Service (HIWAS) will be impacted when a VOR providing HIWAS capability is decommissioned.

Paul provided one example of how one Victor route was being impacted - Victor 3 (V3) utilizes has 19 VORs, half of which are to be decommissioned. It was decided that the airway would be totally redesigned in its entirety on a single effective date, rather than a segment at a time.

Michael Stromberg, Air Wisconsin, inquired if during this process, the FAA would look at environment efficiencies to enable the new routes to be more fuel efficient. Paul replied that during this transition, the WG will not do any environmental impact analysis. RNAV routes will be developed directly over current Victor airways to avoid the need for environmental analysis.

Valerie Watson, AJV-3B, thanked JoAnn for the excellent update on this initiative and asked that continued briefings be provided at future ACF meetings as the issue progresses.

ACTION: AJW-41 will continue to keep the ACF apprised of the status of this initiative.

Meeting 13-02

Rowena Mendez, AJM-324, provided an update on the progress made towards the transition of the NAS from a VOR-based to a satellite-based system. Rowena reviewed how the current VOR-based system operates, citing 966 FAA owned and operated VORs, most of which are very old and would require well over $1 Billion dollars to replace and modernize. The VOR Minimum Operational Network (MON) is projected to reduce the number of VORs by about 50 percent, but will continue to enable navigation of the NAS via VOR should GPS outages occur.

Rowena stated that since the last ACF briefing, the initial criteria and list of VORs to be shutdown has been drafted and has been given to the Department of Defense and RTCA. AJM-324 is awaiting feedback. She described that analysis is ongoing to evaluate maintenance work necessary for potentially remaining VORs as well as extension of the service volume of selected VORs from 40 NM to 77 NM. She mentioned that flight check validation of expanded service volumes would need to occur.

Gary Fiske, AJV-8, expressed concern that the new service volume of 77 NM could vary by altitude. Rowena stated that the base altitude is set to be established for 5,000 feet, but that discussions were still ongoing.

Lynette Jamison, AJR-B1, asked if the VORs designated to be part of the VOR MON would be restored to full operational status. Rowena responded yes, that is the intention.

Valerie Watson, AJV-3, inquired as to whether a significant proliferation of standalone DMEs is still part of the plan for the VOR MON. Rowena replied that an analysis is being done on the potential use of standalone DMEs.

Steve Van Camp, iBIZ Contract Support to AFS-420, inquired as to whether Congress was fully informed regarding the decommissioning of VORs. Rowena stated that her office is doing everything to insure that the lines of communication are kept open and that a number of inquiries from various Congressional offices regarding the decommissioning of specific VORs have been received and are being dealt with.

Discussion with the audience focused on the potential impact of the decommissioning of VORs on various aircraft operations and procedures. Proponents from airlines mentioned and discussed the potential impact on engine out procedures. Stakeholders expressed wide concern that they be provided the opportunity to comment and engage in discussions regarding the MON initiative. Rowena stated that comment periods would be provided before action takes place.

ACTION: Rowena Mendez, AJM-324, will provide an update at the next ACF.

Meeting 14-01

Rowena Mendez, AJM-324, provided an update on the progress made since the last ACF. Rowena stated that the plan includes the transition from 967 VORs to 500 VORs by a revised target date of FY2025. She stated that currently AJM-324 is focused on collaborating with the Tactical Operations Committee (TOC), working with DoD to determine which VORs they can sanction the discontinuance of and collaborating with AJV on how to integrate the VOR MON plan with the PBN program, the National Route Plan, and with Flight Procedures and Charting to insure that NAS operations are not compromised.

Gary Fiske, AJV-822, asked how the changes to the NAS infrastructure will be funded. Rowena responded that the program is currently focused on analyzing the overall technical and operational impact of the discontinuation of VOR services. Once the analytical work is completed, her office can start work on determining the associated costs.

John Belk, AJV-141, asked if there is an expectation that there will be RNAV replacements for conventional procedures as part of this program. He stated that there is not enough funding for that to be the solution. Rowena responded that currently, her office is only looking at the future costs of the discontinuation and that current VOR discontinuations based on PBN replacement procedures are not currently part of the program.

Mike McGinnis, American Airlines, asked if the large-scale Metroplex redesigns currently underway will help with this transition. Rowena responded that yes, they will help because they rely more heavily on PBN. Gary supported this and stated that metroplex projects are not designing routes that are predicated on NAVAIDs because they are aware of this future transition.

Bob Lamond, NBAA, stated that he is hopeful the plan is to retain sufficient VORs to ensure safety. He stated that he had submitted concerns to the FAA which have not been addressed, and VORs are already beginning to be turned off.

Valerie Watson, AJV-3, commented that there needs to be a greater understanding of the future usage of standalone DME facilities. The charting offices have a lot of questions about how to publish standalone DME facility data. Is there an associated frequency? Morse code? Associated RCOs? Rowena responded that they don't know all the answers yet. Right now, DMEs are still defined by the associated VORs. Valerie stated that for now, AJV and AIM will not publish standalone DMEs and will continue to leave them in the database as a VOR/DME with a remark that the associated VOR is out of service. Valerie asked Rowena if she could collaborate with her office and AIM to help define the database & charting requirements for standalone DMEs. Rowena agreed that when she has more answers, she will communicate them.

Gary asked if standalone DMEs will be left in the same location where the DME had been previously paired with a VOR or if the standalone DME could be relocated. Rowena stated that yes, relocation is a possibility and may be an opportunity for the FAA to eliminate some of its leases and save money.

Rowena stated that the Final Investment Decision will be made in FY 2015. Then the VOR Discontinuation Plan will start to take shape. Rowena is looking for ideas on how the discontinuation process can be made more efficient. She said that her office will continue to collaborate with all the stakeholders to identify requirements and address the concerns.

ACTION: Rowena Mendez, AJM-324, will provide an update at the next ACF.

Meeting 14-02

Leo Eldridge, Tetra Tech, Contract Support to AJM-324, briefed the issue. Leo reviewed the plans for transitioning the NAS from a VOR-based NAS to an RNAV/PBN-based NAS. It is estimated that 90% of the general aviation and commercial aircraft operating within the NAS are GPS equipped. The numbers for DoD aircraft equipped with GPS were estimated to be around 60%. The need for VORs is in decline and it is still the FAA's intention to eliminate 30% to 50% of the existing VORs by 2025. The reduction will begin gradually over the first five years during which time the bulk of the procedural/airway/airspace work will assessed. Then the plan is to accelerate the process, with approximately 20 to 25 VORs decommissionings accomplished per year. Leo emphasized that there is a great deal of pre-coordination required in the decommissioning of these VORs. Many of the remaining VORs will be enhanced to supply increased service volume.

Leo stated that the coordination efforts between the FAA and DoD is ongoing. MITRE is working with the DoD to identify the VORs that will need to be retained to meet DoDs needs.

Leo emphasized that only FAA owned and operated VORs will be considered for decommissioning. There has been some discussion regarding the possibility that local authorities and airports may privatize a number of VORs that have been identified for decommissioning.

Leo discussed several challenges related to the implementation of the VOR MON. These include impacts to Instrument Flight Procedures, the implementation of the PBN National Route Structure, ongoing engineering analysis, stakeholder coordination, co-located facilities (HIWAS, RCO, ATIS, DME), and rulemaking changes. Many of these details are still unanswered.

Leo concluded by reviewing the next step for the VOR MON program. AJM-324 is still in the process of coming up with a detailed program plan. The Final Investment Decision is expected in September 2015.

ACTION: Leonixa Salcedo, AJM-324, will provide an update the next ACF.

MEETING 15-01:

Leonixa Salcedo, AJM-324, briefed the issue. Leonixa gave an overview of the VOR MON program and a status report since the last ACF. She reviewed the progress made to date on identifying VORs that may be decommissioned. She pointed out to the audience a significant change in the number of VORs expected to be decommissioned. Previously, it had been reported that approximately 50% of all the VORs in the NAS would be decommissioned. That estimation has been readjusted to just over 33% (approximately 308).

Leonixa stated that since the last ACF, the criteria for decommissioning VORs has been developed by the FAA and MITRE. Discussions have also taken place between the FAA and the DoD, during which the military emphasized that their operational requirements within the NAS require that fewer VORs be decommissioned.

Leonixa explained that the VOR MON program will be on a 10 year timeline of two phases, with the decommissioning of approximately 308 VORs total. The first phase goes from 2016-2020 and removes 100 VORs. The second phase goes from 2021-2025 and removes the remaining 208 VORs. In the short term, Leonixa stated that a list of VORs initially selected for decommissioning will be released to the public sometime in 2015.

John Collins, GA Pilot, inquired about flight testing the 77 NM Standard Service Volume (SSV) for VORs. Dale Courtney, AJW-292, commented that the initial testing data and feedback is promising.

John Moore, Jeppesen, asked how many airports would be designated as MON Airports. Leonixa stated that the plan is for 145 MON Airports. (See New Topic: RD 15-01-295, Charting of Airports in the MON)

Rich Boll, NBAA, asked how the discontinuation of VOR services would impact Class II Navigation capabilities along the coast of the U.S. Leonixa stated that there would be some impact, but more often than not, VOR services along the coast would see an improvement with the higher SSV. Rich emphasized that NBAA remains concerned about any loss of Class II Navigation along the coast.

ACTION: Leonixa Salcedo, AJM-324, will provide an update the next ACF.

MEETING 15-02:

Leonixa Salcedo, AJM-324, briefed the issue. Leonixa gave an overview of the VOR MON (Minimum Operating Network) program and provided a status report of activity since the last ACF. She reviewed the progress made to date on identifying the specific VORs to be decommissioned and briefed that the number of VORs expected to be decommissioned has been reduced to just over 30% (approximately 308). Leonixa emphasized that the process for decommissioning would follow the process as outlined in Joint Order 7400.2.

Approval for Phase I was received in September 2015. Phase I will run from October 2015 through to September 2020 and will result in 74 VOR decommissionings. Phase II will involve the remaining VOR decommissionings, resulting in a total of 308 by the end of 2025. The final list of all VORs to be decommissioned is still yet to be made public. It is anticipated that over the life of the program (Phase I and II), 15 VORs will be decommissioned in the Western Region, 162 in the Central Region and 131 in the Eastern Region.

Leonixa commented that work continues on evaluating the airway, procedure and airspace impact of those VORs selected for decommissioning. Leonixa emphasized that where a decommissioned VOR

impacts a segment of an airway, that segment may not necessarily be replaced. A significant number of Victor and Jet routes/segments are expected to be eliminated. The total project is expected to generate changes to approximately 7700 instrument flight procedures.

John Collins, GA Pilot, expressed his concern over the current problems within the NAS regarding the disconnect between RNAV routes and Victor Airways. Leonixa stated that work is ongoing to insure those issues are addressed.

Lev Prichard, APA, expressed his concern over the potential impact of a GPS outage and the ability of the MON to handle all the aircraft airborne within the NAS during an outage. Lev asked if facilities have a contingency plan for the loss of GPS. Dale Courtney, AJW-292, responded that there is a concept of operations in place. However, there is still work ongoing to address training, awareness, new AIM guidance, and detailed plans for how the MON would operate should there be a GPS outage, either nationally or within a specific geographic area. Dale stated that the VOR MON is just one part of the FAA's contingency/back up plans.

ACTION: Leonixa Salcedo, AJM-324, will provide an update the next ACF.

MEETING 16-01:

Leonixa Salcedo, FAA/AJM-324, briefed the issue, providing an overview of the VOR MON program and a status report since the last ACF. She reviewed the goals of VOR MON Program (See Slide #2) and the VOR MON Program Timeline (See Slide #3). She stated that the Federal Register Notice (FRN) on the "Provision of Navigation Service for the Next Generation Air Transportation System (NextGen) Transition to PBN (Plan for Establishing a VOR MON)" is due out in a few weeks. Leonixa stated that the number of VORs targeted for discontinuance remains at 308 by 2025.

Leonixa then discussed the recent VOR MON Program accomplishments, including holding two National Planning Working Group meetings to discuss the discontinuance waterfall and the role of Instrument Flight Procedures in the program implementation. Leonixa also reported that the first VOR (Orangeburg, SC) was discontinued in February 2016.

Valerie Watson, FAA/AJV-553, asked if the addition of new DMEs is still part of the plan. Leonixa stated yes and said that a different group within the FAA is handling that aspect of the program.

Rune Duke, AOPA, asked what operators can expect regarding operations and decommissioning. Dale Courtney, FAA/AJW-292, responded that when a VOR is decommissioned, a NOTAM will be issued, the NASR database will be updated and all affected airways, procedures, fixes, etc., will be amended.

Ed Phillips, FAA/AJW-B62, expressed concern over the potential lack of synchronization between changes to procedures and charts when a VOR is decommissioned. Leonixa replied that her office is working to ensure that all VOR decommissionings are carefully pre-coordinated to ensure that all

aspects of the affected airspace and procedures will occur concurrently on a single chart effective date cycle.

Bob Lamond, NBAA, asked if it is possible to publish a list of everything that a specific VOR decommissioning will affect. Dale replied that a notice will be published for general awareness, but will not include a list of all the impacts.

Gary Fiske, FAA/AJV-822 asked if the resultant DMEs are going to be charted. Valerie replied yes, for the present. Per consensus from the last ACF, if the VOR portion of a VOR/DME is decommissioned, the remaining DME would still be charted. She stated that this decision could be reevaluated in the future if a proliferation of DMEs results in chart congestion.

John Collins, GA Pilot, asked, for users of 6-month VFR charts, where the notice of a decommissioning would be published. Valerie stated that all NAVAID decommissionings are published via NOTAM. Also, the Chart Bulletin in the Chart Supplement (previously the Airport Facility Directory or AFD) provides interim updates to VFR charts, so a decommissioned VOR would appear in the Bulletin for an affected VFR chart until the chart is re-issued and reflects the change. The IFR Enroute charts are updated every 56 days, so this should not be an issue.

ACTION: Leonixa Salcedo, FAA/AJM-324, will provide an update the next ACF.

MEETING 16-02:

Dale Courtney, FAA/AJW-292, provided an update. Dale stated that the final policy statement was published in the Federal Register in late July. Part of this announcement was the discontinuance candidate list for Phase I (FY2016-2020) and Phase II (FY2021-2025) https://www.federalregister.gov/documents/2016/07/26/2016-17579/provision-of-navigation-services-for-the-next-generation-air-transportation-system-nextgen. Dale stated that five VORs have already been decommissioned and more are scheduled in the coming months.

Brian Townsend, American Airlines, asked how long and complex the process is for a decommissioning. Dale responded that the timeline varies by location depending on the NAS dependence on the particular VOR. He stated that Operation Support Groups reach out to identify the impact of a VOR identified for decommissioning. He said that the time required to coordinate the decommissioning can vary greatly depending on the amount of work required to address existing airways, IAP, DP and STAR procedures, fixes and holding patterns dependent on the VOR.

Valerie Watson, FAA/AJV-553, asked if progress has been made on updates to the Aeronautical Information Manual (AIM) describing the VOR MON changes. Dale shared the new VOR MON language submitted for the VOR section of the AIM to be published next spring. Valerie pointed out some concerns with the AIM entry. First, the language only mentions the charting of MON airports on Low Altitude enroute charts, but should also include High altitude charts. She also thought there should be

some clarification that MON airports will not be charted simply because they are MON, but will carry the MON designation if they are already indicated for charting on either the High or Low altitude enroute charts. Valerie also stated that she thought the MON Airport language might be more appropriately placed in the Airports section of the AIM rather than under VOR section. Lastly, Valerie suggested that MON Airport be added as a new definition in the pilot controller glossary. Dale agreed.

Rich Boll, NBAA, asked if MON Airport information is considered preflight information. Dale replied yes. Rich suggested that consideration be given to putting MON language in the preflight planning portion of the AIM. Dale responded that the AIM language he showed the audience will appear in the spring as a starting point. As the program evolves and comments are received, the MON Office will expand and improve upon the content and the location of the information that pilots need both for training and preflight planning.

ACTION: The VOR MON Program Office, FAA/AJM-324, will provide an update the next ACF.

MEETING 17-01

Meeting was cancelled.

MEETING 17-02

Leonixa Salcedo, FAA/AJM-324, briefed the issue. She reviewed the history, current timeline and accomplishments of the Very High Frequency Omnidirectional Range (VOR) Minimum Operation Network (MON) program. Leonixa stated that the final policy statement was published in the Federal Register in July of 2016. She also reported that a website (www.faa.gov/go/vormon) has been established to aid in communicating with the public on the progress of the program.

Leonixa reported that to date, 16 VORs have been discontinued. Seven more are planned for discontinuance in the next six months. She also reported that her office plans to publish a list of the VORs that will be retained.

Rune Duke, AOPA, asked what efforts are being made regarding the sustainability of existing VORs that are expected to remain in the system. Leonixa commented that a study is being conducted this year to assess what needs to be done to ensure the sustainability of existing VORs.

John Collins, GA Pilot, asked for clarification of the new Standard Service Volume (SSV) that will be used. Leonixa stated that establishing new VOR service volumes and the associated flight check activity is one of the next steps in the VOR MON program and that the expected values will be 70NM at or above 5000' and 130NM above 18,000' for high VORs. Valerie Watson, FAA/AJV-553, stated that the SSVs are published in the Chart Supplement and AIM. She pointed out that the descriptive text will have to be modified if and when changes to published standard service volumes are confirmed. Leonixa will inform

AJV-5 when the new service volumes are confirmed so that the information in the Chart Supplement can be revised. Her offices will also work the relevant AIM changes.

Valerie then reviewed the publication/charting policy that has been established for DME facilities. She reminded the audience that when the VOR portion of an existing VOR/DME is decommissioned, the remaining DME at that location will retain the same name and location identifier, with the NAVAID type revised to DME.

ACTION: Leonixa Salcedo, FAA/AJM-324, will provide an update the next ACF.

MEETING 18-01

Vince Massimini, MITRE, provided an update for the Very High Frequency Omnidirectional Range (VOR) Minimum Operation Network (MON) program. Vince reported that to date, 23 VORs have been decommissioned and 15 more are planned for discontinuance in the next six months. Vince stated that the number of VORs identified for decommissioning continues to fluctuate a little, with the latest discontinuance target being 311.

Vince reported that they are in the process of extending the standard service volume (SSV) for the VORs that will remain from 40 NM to 70 NM. He said that they are also working to ensure that the VORs that remain are more robust. Michael Stromberg, UPS, asked about the timeline for the new SSV. Vince said they anticipate changes to the SSV to take effect in the next 12 to 18 months. He also said that there is a sister effort underway to extend the service volume of the DMEs. Valerie Watson, FAA/AJV-553, asked Vince for assurance that the change in SSV would be fully socialized and documented well in advance of its implementation. Vince agreed to ensure that.

Rune Duke, AOPA, expressed a concern about AWOS and HIWAS locations that currently transmit over VOR. He said that potential impact of VOR decommissioning on AWOS and HIWAS need to be understood and communicated to pilots. Valerie asked Vince Massimini, MITRE, if they are working with the non-fed weather office on these issues. Vince responded yes and that, in general, an affected AWOS will remain and will be rechanneled to a VHF. Vince commented that HIWAS systems are more complicated. The same weather information available via HIWAS may also be available from flight service if there is an overlapping Remote Communication Outlet (RCO). If that is the case, they will not retain the HIWAS. Vince emphasized that each case is different, needs to be worked individually, and working them will take time.

John Collins, ForeFlight, asked for clarification regarding the naming of the DMEs that will remain and asked if they can be used for flight planning. Vince stated that when the VOR portion of an existing VOR/DME is decommissioned, the remaining DME at that location will retain the same name and location identifier of the original NAVAID and they can be used for flight planning.

MEETING 18-02

Ernesto Etienne, FAA/AJM-324, provided an update for the Very High Frequency Omnidirectional Range (VOR) Minimum Operation Network (MON) program. He reported that in Phase 1, 34 of 74 VORs have been decommissioned and that there are 16 more planned for discontinuance in the next six months. He said that the total number of VORs planned for discontinuance remains at 311.

Ernesto reported that the VOR MON office is in the process of expanding the standard service volume (SSV) from 40 NM to 70 NM for FAA owned and operated VORs that will remain active in the system. This change will require the establishment of two new NAVAID class codes that will correspond to the expanded service volumes: VOR Low (VL) and VOR High (VH).

John Collins, ForeFlight, asked how a pilot, during this transition, would know which SSV a given VOR has been designated. Valerie Watson, FAA/AJV-553 stated that NAVAID class codes are a NAVAID attribute databased in NASR and published as part of the NAVAID listings in the Chart Supplement Airport/Facility Directory. She also showed the VOR/DME/TACAN Standard Service Volume (SSV) Classifications table currently published in the Supplements that describes the service volumes for each NAVAID class code. She stated said that the National Airspace System Resource (NASR) database and the Chart Supplement will need to be updated to incorporate the new NAVAID class codes. She also voiced that the Aeronautical Information Manual (AIM) will need to be updated with explanations for the new class codes and the service volumes they represent.

Sam Blackwell, Jacobs Engineering, pointed out that the suggestion of using VL and VH as NAVAID class codes to indicate the new service volumes would cause an issue with AIRNC 424 coding because the database will only allow for one character in the class code field. Dale Courtney, FAA/AJW-292, said that there is a workgroup currently working on all of these issues. He said he would bring these issues to the workgroup. He said that the workgroup also recognizes the need to address NOTAM policy.

John Collins asked when the new SSVs will be available. Dale stated that his office is still drafting the necessary updates to the FAA Orders. Dale added that they all have to go through flight inspection first and that he expects that they might start showing up in the next year and a half. He said it may take until 2025 to flight check all of the subject VORs.

Valerie re-stated that prior coordination with the National Flight Data Center will need to be accomplished to ensure that the NASR database can be updated to accommodate the new NAVAID class codes and that specifics of the changes to the VOR/DME/TACAN Standard Service Volume (SSV) Classifications table in the Chart Supplements will need to be submitted to AJV-5 well ahead of the projected implementation date.

MEETING 19-01

Ernesto Etienne, FAA/AJM-324, provided an update for the Very High Frequency Omnidirectional Range (VOR) Minimum Operation Network (MON) program. He stated that in Phase 1, 42 of the 74 VORs have been decommissioned. The total number of VORs targeted for discontinuance remains at 311.

Ernesto reported that the Memorandum of Agreement (MOA) for maintenance of the MON Airport list has been signed, and his office will send an updated list in early May to AJV-A for the June 20, 2019 publication date. Rune Duke, AOPA, asked if the plan is still to publish the MON Airport list on the inside back cover of the Chart Supplement. He pointed out that this is valuable real estate and might be better utilized for something pilots use more often, for instance the Pilot Weather Reporting (PIREP) information. Valerie Watson, FAA/AJV-A250, stated that if this publication is moving forward for June, AJV-A will likely have to locate the MON Airport listing on the inside back cover as coordinated, but committed to looking into moving it to another location later.

Ernesto reported that the MON Program Office is in the process of expanding the standard service volume (SSV) from 40 NM to 70 NM for FAA-owned and operated VORs that will remain active in the system. This change will require the establishment of two new NAVAID codes that will correspond to the expanded service volumes: VOR Low (VL) and VOR High (VH). Valerie asked if all the remaining VORs will have the expanded SSV by 2025. Deborah Lawrence, FAA/AJM-32, said that before the new SSVs can be implemented, there needs to be final approval and distribution of FAA Order 6050.32B and all remaining VORs must be flight checked. She said that until those tasks are accomplished, there will be both 40 NM and 70 NM SSVs in the system. John Collins, ForeFlight, asked when pilots should expect to start seeing the new VL and VH NAVAID class codes published. Valerie responded that this effort was still being coordinated. Gary Fiske, Contact Support to FAA/AJV-82, asked if there are expected to be frequency changes to those remaining NAVAIDs due to new interference. Ernesto said yes, frequency changes have already begun.

Rich Boll, NBAA, raised concerns regarding how the discontinuances are being coordinated. He is concerned that there is not enough time to ensure new procedures are developed before procedures are cancelled for the MON. Deborah stated that the VOR MON Program Office coordinates with each facility and with AJV-A to look for mitigations that need to be addressed prior to a discontinuance. Rune stated that some of the Service Centers seems to be very proactive, while others are not. He said users should put in IFP Gateway requests to ensure they have what they need. Rich responded that it should not be users ensuring that proper procedures are in place, it should be the VOR MON Office. Deborah agreed.

There was general audience concern expressed that terminal procedures are being removed before replacement procedures are in place and that more coordination needs to be done with the service centers prior to VOR decommissionings and/or procedure cancellations. Paul Gallant, FAA/AJV-113, said that he is also concerned about the same problem with regard to IFR airways. He reported that his office is finding gaps in the airways (missing segments where an airway simply ends and then resumes at a later point) as the VORs are being decommissioned.

Ernesto committed to looking into the lack of replacement terminal procedures concurrent with cancellations, airway segment gaps and Class airspace definition issues relating to what appear to be uncoordinated VOR decommissionings.

MEETING 19-02

Ernesto Etienne, FAA/AJM-324, provided an update for the Very High Frequency Omnidirectional Range (VOR) Minimum Operational Network (MON) program. He stated that in Phase 1, 52 of the 74 VORs have been decommissioned. The total number of VORs targeted for discontinuance has decreased from 311 to 309, resulting from a Department of Defense request that two VORs identified for decommissioning be retained.

Ernesto briefly touched on the changes related to VOR Standard Service Volume (SSV) classes. Dale Courtney, FAA/AJW-292, provided a more detailed briefing on this topic. [See Briefing: NAVAID Service Volumes (DME, VOR and TACAN)]

Ernesto stated that the biggest challenge for the VOR MON Program is the mitigation of Instrument Flight Procedures affected by VOR that are decommissioned. The second biggest challenge the program has encountered has been securing flight inspections for the retained VORs to verify and implement the new SSVs. As a result of these challenges and the time needed to resolve them, the VOR MON Program Office plans to request an extension of the program beyond 2025 when they meet with the Joint Resources Council in March 2020 to discuss Phase 2.

Rune Duke, AOPA, expressed concern over the decommissioning process and the sustainability of the remaining NAVAIDs. He said there are many NOTAMs published for MON VORs that have been out of service for a long time. He said AOPA is also concerned about the lack of a public notification process regarding discontinuances. Ernesto reported that Leonixa Salcedo, FAA/AJM-324, is working these issues. Rune recommended that those concerns should be addressed in future ACM briefings, including a request for a briefing on the DME, VOR, TACAN Sustainability initiative.

Rich Boll, NBAA, agreed with Rune regarding how the discontinuances are being coordinated. He is concerned that suitable replacements for conventional procedures are not being put in place before the existing procedures are cancelled. Valerie Watson, FAA/AJV-A250, pointed out that this issue was brought up at the last ACM. Also previously discussed were gaps in airways (i.e., missing segments where an airway simply ends and then resumes at a later point as a result of VORs being decommissioned), problems with uncoordinated Military Training Routes, and Class Airspace. Valerie stated that both Ernesto and Deborah Lawrence, FAA/AJM-32, had assured the group that increased coordination would occur. Vince Massimini, MITRE, stated that there is no requirement that airways be continuous. Dave Stamos, NGA, stated that the discontinuation coordination as a whole occurs too late in the process for DoD to adequately handle the changes. Vince said more effort now is being put into pre-coordination. Ernesto asked the audience to send him specific locations where there are known issues.

John Collins, ForeFlight, asked if Preferred Routes are assessed when a VOR is slated for decommissioning. Vince replied that all dependences on the VOR selected for decommissioning are

supposed to be reviewed. Scott Jerdan, FAA/AJV-A310, said the National Airspace System Resource (NASR) database identifies dependent resources, so if they haven't been coordinated, AJV-A will see that and question it, but AJV-A will not run its dependent resources assessment until the VOR has been submitted for decommissioning. This is relatively late in the process for responsible coordination to occur.

MEETING 20-02

Ernesto Etienne, FAA/AJM-323, provided an update for the Very High Frequency Omnidirectional Range (VOR) Minimum Operational Network (MON) program. He reported that Phase 1 was completed in September 2020 with 82 VORs discontinued. Phase 2 has received approval and will include the discontinuance of 225 VORs from 2021-2030. This represents an extension of the program for an additional five years. The total number of VORs that are candidates for discontinuance is 307.

Ernesto briefly touched on the changes related to VOR Standard Service Volume (SSV) classes. Dale Courtney, FAA/AJW-292, provided a more detailed briefing on this topic. [See Briefing: NAVAID Service Volumes (DME, VOR and TACAN)]

Ernesto stated that current work is focused on flight inspection for the new SSVs and mitigation of Instrument Flight Procedures affected by VOR decommissioning.

Gary McMullin, Southwest Airlines, asked about the interaction that the MON Program Office has with the Flight Procedure Team. He said they are still seeing disconnects in the field where procedures were cancelled without a suitable replacement. Ernesto reported that they do meet regularly to discuss these issues and asked the audience to send him specific locations where there are known issues. Valerie Watson, FAA/AJV-A250, said that the same concerns about coordination were voiced at the last ACM and Ernesto took those issues back for resolution. Brent Luna, NATCA, stated that the MON Program Office manages the overall endeavor and the responsibility for detailed work and execution falls on the flight procedure teams within the Service Centers. Brent recommended that those with specific concerns go directly to the appropriate flight procedures team for a quicker resolution.

Doug Phifer, FAA/AFS-470, reported that his office has submitted changes related to the VOR/MON effort for the Aeronautical Information Manual for publication in December. John Collins, ForeFlight, mentioned the new language to be published in the AIM will address revised SSVs.

MEETING 21-01

Ernesto Etienne, FAA/AJM-323, provided a briefing on the Very High Frequency Omnidirectional Range (VOR) Minimum Operational Network (MON) program. Ernesto reported that Phase 2 has begun and includes the discontinuance of 225 VORs by FY30. The total number of VOR candidates for discontinuance continues to be 307. Ernesto reported that even though COVID-19 caused problems, the team was able to meet their goal for 2020 and are on track to meet their goal for 2021. Since the last

ACM, 15 VORs have been discontinued. Six additional VORs are planned to discontinued by 6/17/21, another six by 8/12/21, and another five VOR by 10/7/21 (slides 7 & 8).

Ernesto briefly touched on the changes related to VOR Standard Service Volume (SSV) classes. Dale Courtney, FAA/AJW-263, provided a more detailed briefing on this topic. [See Briefing: NAVAID Service Volumes (DME, VOR and TACAN)]

Ernesto stated that current work is focused on flight inspection for the new SSVs and mitigation of Instrument Flight Procedures affected by VOR decommissioning.

Dave Smith, Air Crew Academy, asked if other countries differentiate between Terminal, Low, and High SSVs. Dale said that the U.S. is unique in how SSV is used. Different terminology is used internationally.

Rich Boll, NBAA, asked about MON airport selection criteria. He asked whether or not runway length is considered. He also asked if they are making sure they are retaining circling approaches. Rich asked if they are coordinating with the flight procedures team to ensure they are retaining enough VORs so there will be a usable MON airport for a variety of aircraft type. Ernesto said that MITRE has conducted the analysis using specific criteria to identify MON airports. Vince Massimini, Tetra Tech, verified coordination between the VOR MON Office and the flight procedures team. When MON airports were selected, the goal was to choose those airports that could best accommodate the most aircraft. They tried to choose secondary airports that had the right kind of approach, e.g. ILS, LOC or VOR, that did not require DME, NDB, or radar. From those, they tried to choose the longest runways available. There are only a few airports with runways less than 5000 feet that had to be chosen.

Mark Whitney, FAA/TWLC1-ZLC, asked whether military GPS jamming was taken into consideration when choosing to decommission a VOR. Ernesto said intentional outages were part of the consideration and that the MON program office does coordinate with the DoD. Dale agreed that military operations were taken into consideration.

Lev Prichard, APA, asked how much coordination and training is happening between the facilities and air traffic. He also asked if practicing a MON approach is included in the pilot training. Vince said he does not know what sort of training is happening at the facilities. He pointed out that the Aeronautical Information Manual (AIM) has been updated with an entire section on VOR MON. It is up to individual pilots to ensure they stay current on all the requirements.

Brent Luna, NATCA, pointed out that the intent of the VOR MON program is a recovery operation. He said they are working with individual facilities directly about necessary mitigation specific to their location. He said that there can't be a standardized national plan because every facility is unique.

MEETING 21-02

Ernesto Etienne, FAA/AJM-323, provided a briefing on the Very High Frequency Omnidirectional Range (VOR) Minimum Operational Network (MON) program. The goal of the program is to support the National Airspace System (NAS) modernization goals as it transitions from VOR navigation to Performance Based Navigation (PBN). The plan is to discontinue approximately 34% (306) of VORs in the contiguous United States by 2030.

During Phase 1 (2016-2020), the FAA discontinued 82 VORs. In Phase 2, the FAA plans to discontinue the remaining 224 VORs. Slide 5 of the presentation summarizes the VOR MON program status. Slide 6 shows the 16 VORs that have been discontinued since ACM 21-01 and slide 7 shows the discontinuances planned through March 24, 2022.

Ernesto briefly touched on the changes related to VOR Standard Service Volume (SSV) classes. Dale Courtney, FAA/AJW-263, provided a more detailed briefing on this topic (see the NAVAID Service Volumes (DME, VOR, and TACAN) briefing).

Ernesto stated they are continuing to focus on flight inspection for the new SSVs and mitigation of Instrument Flight Procedures affected by VOR decommissioning. He then provided contact information for the VOR MON Program on slide 11.

Michael Stromberg, UPS-IPA, asked about specific concerns with the Rockford VOR that was discontinued recently. He said he is concerned that flight inspections are not being completed far enough in advance to solve the problems that come up and asked if this is a widespread problem. Dale said he doesn't know the details of the issue at Rockford, but he's not aware of many such issues occurring. He assured Michael that flight inspection is part of the plan and when issues such as these arise, the FAA will delay the discontinuance of the VOR. Ernesto took an action to follow up with Michael on the issues at this location. Valerie Watson, FAA/AJV-A250, suggested Michael also send an email with his concerns to the VOR MON Program office.

Rich Boll, NBAA, stated his concerns regarding the criteria used in the selection of a MON airport. He asked if consideration is given to making changes to the existing non-RNAV procedures at a MON airport to ensure pilots are getting the best possible climb gradient and the lowest possible landing minimums. Pat Mulqueen, FAA/AJV-A440, said the Instrument Flight Procedures (IFP) group was provided with a list of VOR MON safe procedures. He said they do not add any additional requirements to those procedures, but do try to get the lowest minimums possible. Dale said that prior to designating MON airports, the FAA took a holistic look at what would constitute the most useful airport in the event of an outage and considered various specific criteria. He said obtaining the lowest minimums was not a primary consideration, but this could receive reconsideration in the future and the VOR MON Program is open to discussing specific cases. Valerie asked that the contact information provided for the VOR MON program on slide 11 be used in order to provide feedback on specific locations. She also suggested that in future

ACM briefings, Ernesto could limit the briefing to an update on the status of the VOR discontinuances since most attendees are now familiar with the program.

MEETING 23-01

Ernesto Etienne, FAA/AJM-323, presented on the Very High Frequency Omnidirectional Range (VOR)/Minimum Operational Network (MON) program. The VOR/MON program optimizes the VOR network in the Contiguous United States (CONUS) to provide a backup conventional service in the event of an unplanned Global Positioning System (GPS) outage. New VOR Standard Service Volumes (SSVs) are being implemented and VORs that do not meet the VOR/MON criteria are being discontinued. Slide 4 highlights the program timeline for the two phases of the program. Ernesto said the program should be fully implemented by 2030.

Slide 6 shows depictions of the VOR Low (VL) and VOR High (VH) SSVs. No changes to aircraft are required to use the new service volumes; however, frequency changes are required for some VORs. Ernesto summarized that 242 out of 491 new VOR SSVs have been published and 149 out of 306 VORs have been discontinued. See the VOR MON website (www.faa.gov/go/VORMON) for more information.

John Collins, ForeFlight, asked who is responsible for maintaining the VOR/MON status of an airport. Leonixa Salcedo, FAA/AJM-323, said changes cannot be made to approaches at a VOR MON airport unless it has been pre-coordinated with the VOR MON Program Office. John said it is difficult as a pilot to determine what the criteria is for a MON airport and whether or not a specific approach fits the criteria. He recommended that the Chart Supplement include the approach title and any dependent VORs. John also said he noticed several of the new service volumes are highly stratified. Dale Courtney, FAA/AJW-2630, said those that do not meet criteria will be corrected. He suggested that John send his specific concerns to him and Ernesto.

Pat Mulqueen, FAA/AJV-A440, said the Flight Procedures Group is very careful not to make changes to the list of VOR/MON safe approaches. When a long-term change will occur, they determine which other approach can be suitable for VOR/MON. He would like to speak to John offline about his specific concerns.