

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

RECOMMENDATION DOCUMENT

FAA Control #19-01-333

Subject: LED Lighting at Airfields

Background/Discussion:

In 2007, LED-based lighting began to replace traditional incandescent lighting at both US and foreign airports. This changeover to LED systems will continue as market forces drive manufacturers to producing only LED lighting. Traditional manufacturers no longer produce suitable incandescent lamps. This change to LED lighting can affect operators who rely on EFVS for low visibility approaches, as EFVS technologies do not always detect LED-based lighting. Discussion with the FAA and various flight departments who use EFVS, as well as many who do not, have shown the need for operators to know whether the airfield they are flying into has LED-based lighting on the field prior to departure. This LED replacement situation does not currently affect any approach lighting systems (ALS), as there are no LED-based approach lighting systems operating within the National Airspace System (NAS).

Several operators have asked Flight Standards to identify LED lighting at airfields in the NAS. The LEDs on a field that would have the greatest effect on an EFVS user would be LED HIRLs (of which there are few) and LED Approach Lights (of which there are none).

Recommendations:

Flight Standards is proposing a change to the Terminal Procedures Publication (TPP) to identify the presence of LED lighting on airfields with emphasis on High Intensity Runway Lighting (HIRLs) as well as identifying any ALS' with LEDs if and when they are adopted.

These changes will also be addressed in the AIM, IPH, Chart Supplement, Chart User's Guide and possibly the AIP.

Several options will be presented and be open for discussion/comments.

Comments:

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Date: March 21, 2019

MEETING 19-01

Matt Harmon, FAA/AFS-410, [briefed the new topic](#) and provided a brief history on issues associated with the use of Light Emitting Diode (LED) lighting at airports. Matt explained that most incandescent lamp suppliers have been forced to become LED suppliers so the FAA has no choice but to change Runway Lighting and Approach Lighting Systems (ALS) to LEDs. He said there are currently no certified LED ALSs in the National Airspace System (NAS) though there are a number of High Intensity Runway Edge Lighting (HIRL) systems in place and users of Enhanced Flight Vision Systems (EFVS) have requested they be identified. In the near future, in addition to runway edge lighting systems, it is expected that ALS will also begin being installed with LEDs.

In order to increase awareness of LED lighting, Matt is recommending that the FAA modify the lighting symbols on Instrument Approach Procedure (IAP) charts to identify the presence of LEDs. He suggested adding an "L" to denote the presence of LED lighting, or modifying the symbol used on the chart ([See Slides 4-6](#)). He also recommends that a note be added to the airport remarks in Chart Supplement entries to indicate that LED lighting is in use ([See Slide #7](#)). He understands that updates to pilot guidance in the Instrument Procedure Handbook (IPH), Aeronautical Information Manual (AIM), and Chart User's Guide will also have to follow.

Michael Stromberg, UPS, commented that because LED lights are not visible when using EFVSS, there have been experiments done adding Infrared signatures to LED systems, but he understands that is very expensive. Michael then asked if there could be a mix of LED and incandescent lighting at an airport. Matt said there would not be both types of lighting used in a single lighting system, but that there could be both LED and incandescent systems at a given airport.

Gary McMullen, Southwest Airlines, expressed concern that LED lights are overly bright. Matt responded that his office is aware of that problem and the intensity has been lowered at some locations. He recommended that pilots file complaints for lights that are too bright.

The question arose whether LEDs will be used for Runway Touchdown Zone or Centerline Lighting systems. Chris Hope, FAA/AFS-410, said that as the runway edge lights are tied to procedure minima, they are looking into that first. Rich Boll, NBAA, said that they would like to see all LED lighting identified, including touchdown zone lighting. Juergen Kuhnhenh, Lido, said that Lido supports the identification of LED lighting, but they would like more details on the impacts. He asked about minima credits depending on the type of runway lighting. Chris responded that minima credit is yet to be determined and that currently the focus is on impacts for flight planning.

Valerie Watson, FAA/AJV-A250, noted strong consensus of the audience for publishing the existence of LED lighting systems. She stated that, in the past, the charting offices could not pursue the publication of LED lighting systems because there was not a source for the data. She suggested working with the FAA Office of Airports to collect this data is the first step. Chris said his office is working with the Office Airports and are working toward getting this information added to FAA Form 5010, Airport Master Record. She stated that once a reliable source for LED lighting system locations is established, the charting offices will investigate the best way to communicate this information to users.

STATUS: OPEN

ACTION: Matthew Harmon, FAA/AFS-410, will continue to work with the Office of Airports to secure a source for the LED data.

MEETING 19-02

Joe Lintzenich, FAA/AFS-410, Contract Support, provided an update. He stated that the Flight Operations Group is continuing to work with the Office Airports to get LED lighting systems added to FAA Form 5010, Airport Master Record. Once a reliable source for LED lighting system locations is established, then the charting offices will investigate the best way to communicate this information to users.

STATUS: OPEN

ACTION: Joe Lintzenich, FAA/AFS-410, Contract Support, will continue to work with the Office of Airports, FAA/AAS-100, to secure a source for the LED data.

MEETING 20-02

Samer Massarueh, FAA/AJV-A221, reviewed the issue. Matt Harmon, FAA/AFS-410, reported that the Flight Operations Branch is continuing to work with the Office Airports to get LED lighting systems added to FAA Form 5010, Airport Master Record. Once a reliable source for LED lighting system locations is established, the AJV-A charting/publication offices will investigate how to communicate this information to users.

STATUS: OPEN

ACTION: Matt Harmon, FAA/AFS-410, will continue to work with the Office of Airports, FAA/AAS-100, to secure a source for the LED data.

MEETING 21-01

Samer Massarueh, FAA/AJV-A223, reviewed the issue. Matt Harmon, FAA/AFS-410, said there is nothing new to report. The Flight Operations Branch is continuing to work with the Office of Airports to have LED lighting systems added to FAA Form 5010, Airport Master Record, so the information can be collected and submitted for publication. Once a reliable source for LED lighting system locations is established, Aeronautical Information Services charting/publication offices will investigate how to communicate this information to users.

STATUS: OPEN

ACTION: Matt Harmon, FAA/AFS-410, will continue to work with the Office of Airports, FAA/AAS-100, to secure a source for the LED data.

MEETING 21-02

Samer Massarueh, FAA/AJV-A223, reviewed the issue. Matt Harmon, FAA/AFS-410, reported that there is no status change and the Flight Operations Branch is continuing to work with the Office of Airports to have LED lighting systems added to FAA Form 5010, Airport Master Record, so LED lighting information can be collected and submitted for publication.

Drew Goldsmith, FAA/AAS-120, confirmed the Office of Airports is working on updating the 5010 and the Airport Data and Information Portal (ADIP) to collect LED lighting information.

Jon Gdowik, FAA/AJV-A313, stated it will take time for the National Airspace System Resource (NASR) database to be enhanced to accept LED lighting requirements. The Aeronautical Data Team needs to fully understand the source flow/process and what the data publication requirements are before they can begin to making changes to NASR. Jon said his team would like to begin this work as soon as possible. Valerie Watson, FAA/AJV-A250, asked if this topic is being discussed at the monthly meetings between AJV-A and AAS-100. Jon said he doesn't recall if LED lighting is on that agenda, but said he will ensure it is discussed at future meetings.

STATUS: OPEN

ACTION: Matt Harmon, FAA/AFS-410, will continue to work with the Office of Airports, FAA/AAS-100, to secure a source for the LED data and will report back at the next ACM.

ACTION: Jon Gdowik, FAA/AJV-A313, will report on the status of enhancements to the National Airspace System Resource (NASR) database for LED lighting information.

MEETING 22-01

Matt Harmon, FAA/AFS-410, reported the project to collect LED lighting information is gaining traction. He said FAA Form 5010 (Airport Master Record) and the Airport Data and Information Portal (ADIP) will be updated to collect and reflect LED lighting information. Advisory Circular (AC) 150 is being updated to add LED lighting to the airfield approach lighting requirements to explain how they will be collecting that information.

Aaron Jacobson, Jeppesen, asked if they are still planning to update the lighting symbology to indicate LED lighting as was briefed originally. Matt said there is no consensus yet about how it will be charted, but he does expect that it will be graphically depicted. Valerie Watson, FAA/AJV-A250, said the first step is securing the source, then it must be determined how the data will be stored in the National Airspace System Resource (NASR) database. Then we can look at where and how LED lighting will be shown on/in the products.

STATUS: OPEN

ACTION: Matt Harmon, FAA/AFS-410, will continue to work with the Office of Airports, FAA/AAS-100, to secure a source for the LED data and will report back at the next ACM.

MEETING 22-02

Mike Melssen, FAA/AFS-410, said he has nothing new to report, but said his team will continue to work on this issue and will report at the next meeting.

STATUS: OPEN

ACTION: Mike Melssen, FAA/AFS-410, will continue to work with the Office of Airports, FAA/AAS-100, to secure a source for the LED data and will report back at the next ACM.

MEETING 23-01

Matt Harmon, FAA/AFS-410, reported that as airports are transitioning to LED lights, his office would still like to find the best way to alert pilots to the presence of LED approach lighting systems.

Rich Boll, NBAA, strongly suggested this information be put on the Instrument Approach Procedures (IAP) charts in some form. He said it makes a big difference and requested NBAA be included in discussion with the FAA on this issue. Guy Copeland, FAA/AJV-A210, thinks lighting information is better to put in the Chart Supplement than on the charts. Rich thinks it is important that pilots have information about the equipment requirements necessary to see the lights. NBAA wants this information on the IAP charts.

Mike Stromberg, UPS IPA, asked if the incandescent LED lights would be charted differently than LED infrared lights. Matt said incandescent is being used in the test and expects they will not be charted any differently. Mike asked if anyone had looked into using infrared lights with the LED. Matt said they looked into it and they work like a normal incandescent light.

Scott Jerdan, FAA/AJV-A310, said this issue was stalled until about a week ago, so he said the National Airspace System Resource (NASR) requirements still need to be defined. He said there is a lot of work to do in order to get this information published and the Office of Airports and Aeronautical Information Services need to be part of the discussion. He pointed out that his team's ability to make NASR enhancements is very limited, so this group should have plenty of time to work this issue.

Jennifer Hendi, FAA/AJV-A250, suggested creating a workgroup with industry to investigate this issue. She requested that individuals send an email to 9-amc-avs-acm-info@faa.gov to be included in the workgroup.

STATUS: OPEN

ACTION: Matt Harmon, FAA/AFS-410, will continue to work with the Office of Airports, FAA/AAS-100, to secure a source for the LED data.

ACTION: Matt Harmon, FAA/AJV-410, will report on the LED Lighting Workgroup with regard to data and charting requirements.

MEETING 23-02

Matt Harmon, FAA/AFS-410, reported there has been no change to this proposal since he briefed the topic at the last ACM.

Jennifer Hendi, FAA/AJV-A250, asked whether Flight Standards wants the workgroup to get together and discuss the data and charting requirements for LED information. Matt said not yet. First, they need other FAA offices to agree to source this information.

Rich Boll, NBAA, asked whether the FAA is still in discussions with the Office of Airports about how to collect information about LED lights. Matt said there is currently no money to implement the changes necessary to collect the data or incorporate it into FAA Form 5010. Until the effort is authorized at the management level, the work cannot move forward. Rich said LED lights replacing incandescent lights is having a negative effect on aircraft with enhanced vision systems. Rich thinks this effort needs to engage the Office of Airports more heavily to find a way to source the data.

Jennifer Dahlstrom, FAA/AAS-120, said the Office of Airports can help to collect this data. They first need the specifications about what data to collect and how it should be housed in the Airport Data Information Portal (ADIP). The Office of Airports can then work with AJV-A on the publication of the data. Jennifer and Matt agreed to set up a meeting to talk about the issue.

Dan Wacker, FAA/AFS-420, asked whether the LED has been deemed better than the incandescent based on the angles required by TERPS. Matt said the LEDs must meet the same lighting requirements as other visible lights. Matt said he can talk to Dan after the meeting to answer his questions in more detail.

Jennifer Hendi summarized the issue and said the issue will be kept open for Matt and Jennifer Dahlstrom to work together on the source for LED data.

STATUS: OPEN

ACTION: Matt Harmon, FAA/AFS-410, will work with Jennifer Dahlstrom, FAA/AAS-120, and the Office of Airports to secure a source for LED data.

MEETING 24-01

Matt Harmon, FAA/AFS-410, reported that since the last ACM, the light emitting diode (LED) lighting workgroup has met and discussed the collection and charting of LED data. He said there was an agreement to chart an "L" to indicate LED lighting. Matt said that in the interim, his office will list all airfields with LED lights on the AFS-410 enhanced flight vision systems website. This is a temporary solution until an LED lighting indication can be charted. He said the changeover rate to LEDs is very slow. Matt reiterated that he is still working through how to collect this data and how to publish it and he would like to leave this issue open until that is complete.

Aaron Jacobson, Boeing/Jeppesen, asked if this applies to all lighting at an airfield or only approach lighting systems (ALS). Matt replied that this is only for ALS for now because they are FAA-owned, and the other lights are owned by the airfield. That makes it difficult to collect the data.

Krystle Kime, FAA/AJV-A222, asked Matt to clarify that the intent was to have an LED symbol charted on instrument approach procedures (IAP). Matt confirmed. Krystle said terminal charting was not part of the workgroup meeting and she would like to ensure they are included in any future meetings.

Julie Morgan, FAA/AJV-A310, pointed out that if the long-term expectation is to have LED lighting on the charts, the data must first be in the National Airspace System Resource (NASR) database. She emphasized that the Aeronautical Data Team needs to be part of any conversation related to data requirements.

Matt committed to future discussions with the appropriate FAA offices and said he would report back at the next meeting.

STATUS: OPEN

ACTION: Matt Harmon, FAA/AFS-410, will report on the progress of the LED lighting workgroup to develop data and charting requirements for LED lighting.

MEETING 24-02

Matt Harmon, FAA/AFS-410, provided a [briefing](#) on the LED lighting recommendation. Matt said the original recommendation to add a new symbol to the Instrument Approach Procedure (IAP) charts to indicate LED was going to require too many changes and take too much time and money to accomplish. Instead, the decision was made to publish a text remark in the Chart Supplement Airport/Facility Directory entry that indicates LED approach lighting systems (ALS) is in use. The standard note will be placed in the Airport Remarks section. He said the FAA transition to LED ALS has already begun and the collection of the data is in progress. Users can expect to see the new note beginning with the December 2024 or February 2025 charting cycle. The list of airport and runway ALS' that have been converted to LEDs will continue to be maintained on the [Enhanced Flight Vision Systems \(EFVS\)](#) website. Matt recommended that this issue could now be closed.

Steve Madigan, Garmin, asked why it was decided to put this information in the airport remarks. He said it would be more appropriate in the Runway section so it wouldn't get lost in the large block of airport remark text. Matt said he understands that concern, however Aeronautical Information Services said the easiest and quickest way to get the information into the Chart Supplement is to add it as an airport remark.

Rich Boll, NBAA, stated that NBAA is one of the largest users EFVS and since approach lighting is a briefing item when flying an instrument approach, he still thinks having an indication on an IAP is appropriate. He said he does, however, understand the reasons for not doing that at this time. For certificated pilots that are required to use EFVS, he asked how this information is being communicated and if pilots are made aware that LED systems are being installed. Matt replied that yes, the EFVS group within FAA/AFS-410, is working to ensure pilots are made aware of this effort. Rich then asked how the Part 91 operators are getting this information. Matt

said they are reaching out to that group as well with informational papers, EFVS website information, and outreach. Rich asked if an FAA All Information for Operators (InFO) could be published to explain this change and to let pilots know where they can go to get the necessary information. He said being able to point to a specific FAA document makes it much easier for NBAA to send out communications to their membership. Matt agreed with the idea and said he would take it back to his management. Rich then asked if guidance will be added to the Aeronautical Information Manual (AIM) on this topic. Matt replied yes.

Aaron Jacobson, Boeing/Jeppesen, asked if the remark in the Chart Supplement will be a general note, or if it will be runway specific. Matt replied that it would be a general note and not runway specific. The runways can be identified using the [Enhanced Flight Vision Systems \(EFVS\)](#) website. Aaron then asked, how the pilot will be able to identify this note exists in the big block of airport remarks. He asked if there is a way to make it stand out. Jeff Lamphier, FAA/AJV-A240, explained that the FAA cannot currently put the remark in another location because the cost associated with a National Airspace System Resource (NASR) change. To get the needed information out quickly, it had a standard remark placed within NASR and subsequently within the airport remarks section. For the placement within the airport remarks, the Chart Supplement team will decide where it should be placed and will add that to the priority list in their Standard Operating Practice (SOP).

Rich then spoke to Aaron about the Jeppesen practice of pulling out airport remarks and placing them on the 10-9 chart. Rich asked if this remark will be pulled as well. Aaron said yes, that is the plan. He would also like to add the runway specific information from the website to their product.

Jennifer Hendi, FAA/AJV-A250, concluded the discussion by stating that work on this issue is complete and the topic can be closed.

STATUS: CLOSED