Issued on December 7, 2022.

Christina Underwood,

Acting Director, Compliance & Airworthiness Division, Aircraft Certification Service.

[FR Doc. 2022–27925 Filed 12–22–22; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Docket No. FAA–2022–1472; Airspace Docket No. 22–AWA–8]

RIN 2120–AA66

Amendment of Class C Airspace; Manchester, NH

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; correction.

SUMMARY: The FAA is correcting a final rule published in the **Federal Register** on December 6, 2022, that amended the Manchester, NH Class C airspace description to update the Manchester Airport name and airport reference point (ARP) geographic coordinates. In the description of the Class C airspace area, the final rule contained an error in the longitude coordinate of the ARP. This action makes an editorial correction to insert the correct longitude coordinate in references to the ARP.

DATES: Effective date 0901 UTC, February 23, 2023. The Director of the Federal Register approves this incorporation by reference action under 1 CFR part 51, subject to the annual revision of FAA Order JO 7400.11 and publication of conforming amendments.

ADDRESSES: FAA Order JO 7400.11G, Airspace Designations and Reporting Points, and subsequent amendments can be viewed online at *www.faa.gov/air_traffic/publications/.* For further information, you can contact the Rules and Regulations Group, Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591; telephone: (202) 267–8783.

FOR FURTHER INFORMATION CONTACT: Paul Gallant, Rules and Regulations Group, Office of Policy, Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591; telephone: (202) 267–8783.

SUPPLEMENTARY INFORMATION:

History

The FAA published a final rule for Docket No. FAA–2022–1472 in the **Federal Register** (87 FR 74505; December 6, 2022), to update the ARP for the Manchester, NH airport. Subsequent to publication, the FAA determined that the ARP longitude geographic coordinate was in error. This rule corrects that error by changing the references from ''long. 71°45′39″ W'' to ''long. 71°26′09″ W''. This is an editorial change only to match the FAA's National Airspace System Resource database information.

Class C airspace areas are published in paragraph 4000 of FAA Order 7400.11G, dated August 19, 2022, and effective September 15, 2022, which is incorporated by reference in 14 CFR 71.1. The Class C airspace listed in this document will be published subsequently in FAA Order JO 7400.11.

Correction to Final Rule

The reference to the Manchester ARP longitude coordinate published in the **Federal Register** of December 6, 2022 (87 FR 74505), FR Doc. 2022–26458, is corrected as follows:

1. On page 74506, in column 2, under the heading ''The Rule'' revise ''The ''Manchester Airport'' name is changed to ''Manchester Boston Regional Airport'', to match the Airport Master Record database, and the ARP geographic coordinates are updated from ''lat. 42°56′00″ N, long. 71°26′16″ W'' to ''at. 42°55′58″ N, long. 71°45′39″ W'' to read ''The ''Manchester Airport'' name is changed to ''Manchester Boston Regional Airport'', to match the Airport Master Record database, and the ARP geographic coordinates are updated from ''lat. 42°56′00″ N, long. 71°26′16″ W'' to ''lat. 42°55′58″ N, long. 71°26′09″ W.''

2. On page 74506, in column 3, under the heading ''ANE NH C Manchester, NH [Amended]'' revise ''Manchester Boston Regional Airport, NH (Lat. 42°55′58″ N, long. 71°45′39″ W)'' to read ''Manchester Boston Regional Airport, NH (Lat. 42°55′58″ N, long. 71°26′09″ W)''.

Issued in Washington, DC, on December 19, 2022.

Scott M. Rosenbloom,

Manager, Airspace Rules and Regulations.

[FR Doc. 2022–27928 Filed 12–22–22; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 77

[Docket No: FAA–2011–1279]

Airborne Wind Energy Systems (AWES) Policy Statement

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Policy statement.

SUMMARY: FAA is finalizing its policy on the applicability of regulations concerning the safe, efficient use and preservation of the navigable airspace to all airborne wind energy systems (AWES).

DATES: This policy is effective December 23, 2022.

FOR FURTHER INFORMATION CONTACT: Brian Konie, Airspace Rules and Regulations Team, Air Traffic Organization, Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591; telephone: (202) 267–8783; email: *brian.konie@faa.gov.*

SUPPLEMENTARY INFORMATION:

I. Statutory Authority

Congress, pursuant to 49 U.S.C. 44718, mandated that the Secretary of Transportation require the public to provide notice to FAA of ''the construction, alteration, establishment, or expansion, or the proposed construction, alteration, establishment, or expansion, of a structure or sanitary landfill when the notice will promote (1) safety in air commerce; (2) the efficient use and preservation of the navigable airspace and of airport traffic capacity at public-use airports; or (3) the interests of national security, as determined by the Secretary of Defense.'' Moreover, under that section, the Secretary is required to conduct an aeronautical study to decide the extent of any adverse impact on the safe and efficient use of the airspace, facilities, or equipment if the Secretary decides that constructing or altering a structure may result in an obstruction of the navigable airspace, an interference with air or space navigation facilities and equipment or the navigable airspace, or, after consultation with the Secretary of Defense, an adverse impact on military operations and readiness. FAA codified these requirements in Title 14 of the Code of Federal Regulations (14 CFR) part 77 and identified the form and manner in which a person must submit notice.

II. Background

In 2011, FAA published a notice of policy and request for information (Notice) stating its policy on the application of 14 CFR part 77 to temporary AWES.[1] The Notice also contained a request for information from AWES developers and the public on these systems so that FAA can

[1] Notification for Airborne Wind Energy Systems (AWES), Docket No. FAA–2011–1279 (76 FR 76333, Dec. 7, 2011) (Notice).

comprehensively analyze AWES and evaluate the potential impacts of their long-term integration into the National Airspace System (NAS).

The Notice stated that the Obstruction Evaluation process under part 77 applies to any new forms of wind gathering devices, including temporary AWES proposals.[2] This allowed the FAA to gather data about these devices while the technology continued to develop.[3] The notice explained that anyone proposing to conduct temporary airborne testing of AWES for data collection purposes must comply with part 77, including the requirement in section 77.13(a)(1) that requires notice of any construction or alternation of more than 200 feet above ground level (AGL).

Airborne wind energy (AWE) is the conversion of wind energy into electricity using tethered flying devices.[4] An Airborne Wind Energy System (AWES) is a temporary or permanent structure, which consists of a self-supported airborne system tethered to a ground station, with an airborne or ground-mounted drivetrain used to convert kinetic energy in the wind to mechanical power for purpose of generating electricity. The tethered aspect of AWE provides the opportunity to harvest stronger and more consistent wind found at higher altitudes.[5]

While many AWES are similar in concept (designed to harvest kinetic wind and create consumable power), the technology and individual components, specifically the aloft portion, differ dramatically. Regardless of entity-specific design and potential resemblance between designs, each AWES possesses different attributes. Due to different attributes and impacts on NAS, FAA concluded that it must study each proposed AWES deployment on a case-by-case basis to analyze the surrounding aviation environment and ensure aviation safety.

III. Request for Information

In the Notice, FAA identified concerns regarding AWES operations in the NAS, (*e.g.,* conspicuity to aircraft via marking and lighting), desired operational airspace volumes, potential impact on various NAS facilities (*e.g.,* communication, navigation, and surveillance), and overall safety. These concerns remain relevant to FAA's management of a safe and efficient NAS for all users.

In addition to operational concerns, FAA also recognized the various design concepts AWES developers use for individual AWES components. These varying concepts include the components that keep the system aloft, the power-generating equipment, the energy-transferring equipment, the maneuvering controls, and the physical and operational dimensions. Given the variation in potential AWES design, operations, and technologies, FAA requested information from the industry in the Notice. Examples of information requested included design concepts and safety mechanisms; the type, material composition, and physical dimensions of mechanical devices employed to keep the system aloft; and long-term plans for this system. FAA also requested information to determine if proponents could comply with existing marking and lighting requirements and to discern how an AWES will be conspicuous to the flying public.

IV. Summary of Comments

In response to the Notice, FAA received 20 comments during the comment period. Eight comments came from individuals and 10 comments came from major organizations or industry stakeholders. Six of the ten major organization or industry stakeholder commenters were from companies developing various types of AWES (Altaeros Energies, Inc., EnerKite GmbH, Highest Wind, LLC, Makani Power Inc., SkySails GmbH, and Windlift, LLC); two were from organizations or associations representing the wind energy industry (Airborne Wind Energy Consortium (AWEC) and Airborne Wind Energy Industry Association (AWEIA)); and, two were from associations representing the aviation industry (Experimental Aircraft Association (EAA) and National Agricultural Aviation Association (NAAA)). Of the 18 comments, 11 supported FAA's AWES policy and 7 opposed the policy. Of the seven comments that either wholly opposed AWES operations or supported change to enable safe AWES operations, four supported traditional marking and lighting per FAA Advisory Circular (AC) 70/7460–1, *Obstruction Marking and Lighting,*[6] and two expressed support for part 77 notice and analysis. Additionally, 13 of the 20 comments received provided additional recommendations.

FAA summarizes and addresses those comments responsive to the Notice.[7]

1. Proposed system designs. While specific designs vary, based on comments received from industry, FAA finds general consistency in a three-part design with an aloft portion attached to a ground station via a mooring cable, tether, or similar device. Altaeros Energies' aloft portion is an inflatable shell filled with helium; EnerKite and SkySails' is similar to a textile kite; Highest Wind's concept resembles an autogyro; and Makani and Windlift plan for a wing made from lightweight rigid or flexible fabric wings, respectively.

The material used for the tether or similar device varies across system designs, *e.g.,* carbon fiber, interwoven copper cable, or polyethylene (Dyneema™) fibers. These designs incorporate control of the aloft portion to maximize wind energy capture from either the ground station or from a segment of the aloft system, *e.g.,* a module suspended below the canopy. The aloft portion of some proposed (called fly-gen) systems are generally static, generating electricity aloft and transferring it to the ground station, while other proposed (called ground-gen) systems use a winching system to generate electricity within the ground station. The size of the aloft portion varies within models from singular companies and across companies, with Highest Wind's test article a smaller size than their planned operational model. Additionally, some ground stations incorporate a mobile design to enable ease of transport and portable use.

2. Airspace, operational, and safety considerations. Many industry comments provided conceptual discussions of their systems and indicated that the companies remain in the testing phase. Based on the nature of the aloft portion's need to move (while tethered to a fixed ground station) for electricity generation and the stated desired altitudes for harvesting wind energy, the systems have different desired operational airspace volumes.

While comments focused on operational altitude, four commenters submitted diagrams that also considered the lateral airspace aspect, *e.g.,* operations to 2,000 feet AGL at a 30-degree altitude requires a lateral distance of 3,500 feet. Some commenters integrated safety or buffer zones into their proposed airspace plan

[2] *Id.* at 76334.

[3] FAA also stated in the Notice that it may address permanent and operational AWES under part 77 in the future after further evaluation and risk assessments.

[4] *www.energy.gov/eere/wind/articles/new-report-discusses-opportunities-and-challenges-airborne-wind-energy.*

[5] *Id.*

[6] Available at *https://www.faa.gov/regulations_policies.*

[7] The FAA does not address comments that are not responsive to the request for information in the Notice.

to depict the area needed to mitigate the safety risk to other airspace users and persons and property on the ground.

Altaeros completed testing below 200 feet AGL and all industry commenters expressed interest in either testing or sustained operations below 2,500 feet AGL. Five commenters expressed their desire to conduct uninterrupted testing during the day and at night over a period of days or months to replicate a realistic operational environment. As of 2011, SkySails tested aboard vessels at sea.

EAA believed that the deployment of AWES systems above 500 feet AGL will have an adverse effect on recreational and general aviation flight safety operations. EAA and other commenters suggested conducting initial tests or data collection in established prohibited and/or restricted areas before allowing AWES access to the rest of the NAS. One non-AWES industry commenter remarked that creating more special use airspace is invasive to an already crowded NAS. Another commenter expressed concern about potential conflict between AWES and other aircraft and suggested AWES deployments at the same altitude as existing terrain.

Companies planned to test and operate in either single configurations or in small (*e.g.,* 3–5 units) or large (*e.g.,* 300 units) farms on land or offshore. Highest Wind asserted that they can find willing private landowners underlying Class G airspace, where there is virtually zero air traffic below 3,000 feet AGL, to host testing. Additionally, Highest Wind requested that FAA ''designate a specific number of no-fly zones up to 2,000 feet AGL over private lands'' for testing and development purposes to reduce any burden of marking and lighting. NAAA stated that AWES deployments could render blocks of farmland untreatable by air, as aerial crop protection pilots would avoid the entire AWES ''cone of flight'' considering the shifting location and angle of an AWES due to wind variations. An aerial application (part 137) flying service commenter opposed AWES and believes they are a safety risk to agricultural and general aviation. The commenter stated that the amount of affected airspace would severely disrupt aviation.

A pilot expressed safety concerns about the ability of an AWES' aloft portion to remain attached to the ground station in adverse weather and the length of time it takes to return the aloft portion to the surface. Industry commenters provided numerous proposed safety methods specific to their system design and its capabilities. Altaeros commented that they rely on established aerostat practices and that their device has a valve to quickly and safely lower the device during an emergency, *e.g.,* tether failure. EnerKite stated that its system has weak links, a pyrotechnical cutter, and soft wings to minimize any safety risk. Highest Wind commented that their system's ''anti-collision lights and on-board alarm'' comprise their safety considerations. Makani commented that their system is unique from other obstructions and its aloft portion can transition to a stationary hover and land within minutes in case of an emergency or, in case of a tether failure, land the aloft portion at a pre-determined point. SkySails commented that it intends to mark and light its system and, if the aloft system escapes its mooring, the aloft portion will sink to the ground. Additionally, SkySails' system has internal systems to monitor performance and recover the aloft portion as needed due to an emergency and suggested charting AWES to enhance safety. Windlift commented that their system can either quickly retrieve the aloft portion (reel in at 10 meters per second) or fly the aloft portion toward the ground (30 meters per second) to bring the aloft device below 500 feet AGL in less than 6 seconds.

3. Marking and lighting compliance. Sixteen comments mentioned the risk to aviation safety and 13 comments mentioned either marking or lighting—the primary methods that enhance an obstacle's conspicuity for a pilot to see and avoid. Comments ranged from providing full support of FAA's marking and lighting schemes to suggestions of alternative means based on the inability to comply with traditional marking and lighting due to system design.

EAA supported adequate marking and lighting controls for AWES equal to that required for other obstacles. NAAA expressed safety concerns with AWES, specifically the ability of pilots operating at low levels to see and avoid the tether. NAAA explained that a thin AWES tether may prove indistinguishable from the background depending on the time of day and weather conditions and recommended a strobe light on each individual structure and lighting on the tether. To NAAA, properly marked and visible obstructions are a life or death issue for low-level operators. An experienced general aviation pilot expressed AWES safety concerns based on low-level accidents involving MET towers and the difficulty pilots may have seeing an AWES during the day and at night. A part 137 commenter added that aircraft commonly operate safely at altitudes less than a proposed AWES operation and a pilot could mistake the aloft portion of an AWES as another aircraft disregarding the possibility of a tether and inviting disaster. This commenter also stated that the airfoil of AWES would need to be painted and lit and that the tether would need high-visibility strobes positioned at regular intervals to achieve a visual effect.

AWEC proposed a high-intensity light on the airborne portion of the system, flashing at regular intervals at a fixed altitude or flashing at the top and bottom of the (circular) flight path. AWEC proposed to not mark or light the tether, claiming tether drag will prevent an AWES system from achieving desired levels of performance.

Altaeros proposed lighting the structure using a high-intensity blinking light on top of the aloft portion, glow lighting or illumination of the aloft portion from the inside, or one or more spotlights aimed from the ground. Altaeros supported lighting the aerostat and not the tether.

EnerKite's proposed system has brightly colored wings that can have red markings to increase conspicuity. EnerKite commented that decreased weight and movement of the system are substantial factors in system efficiency, thus rendering large obstacle marking infeasible. Additionally, EnerKite stated that flags generate considerable drag and complicate the dynamic extension and retraction of the system. EnerKite stated their system's movement at variable tether lengths also increases conspicuity and proposed the construction of a nearby obstacle with traditional marking and lighting for further enhancement. EnerKite indicated their ability to illuminate the wing from the ground or the nearby obstacle.

Highest Wind commented that current marking requirements in AC 70/7460–1 are overly burdensome and existing lighting requirements would make their system commercially and technically infeasible. Highest Wind asserted that AWES needs the development of new lights with half the weight, size, and energy requirements of those available when FAA published the Notice. Highest Wind also stated they planned to provide an anti-collision light on the flying vehicle to make it conspicuous to pilots in all weather conditions and expressed that marking the tether would be very difficult to achieve. From a testing perspective, Highest Wind desired to test in areas free of aviation then re-visit the marking and lighting requirement.

Makani commented they intended to paint the wing white, in a manner similar to wind turbine blades, and

proposed an option of adding light-emitting diode (LED) lights to the wing tips similar to those used on light aircraft. Makani explained that tether marking encumbers the tether and endangers the system during launching and landing. Therefore, Makani proposed to not mark or light the tether and instead mark the wing and ground station. Makani commented their prototype, at the time FAA published in its Notice, could not comply with current part 77 lighting requirements due to the mass and drag of the lights. However, Makani anticipated the utilization of lighting onboard the aloft portion that flashes at the top and bottom of each loop, emulating the appearance of a stationary radio tower and making the obstacle conspicuous to pilots. In an AWES farm setting, Makani proposed to light the wings in the manner of a traditional wind farm, with lights on the wings at the perimeter of the farm and on wings that are high spots.

SkySails said they could partly comply with marking and lighting requirements but did not provide any specific information. SkySails stated their system will be conspicuous to the flying public with the canopy made of yellow-colored fabric illuminated between sunset and sunrise at the center and wingtips by a spotlight situated on top of the control pod (suspended below the canopy). SkySails commented that if the illumination of the kites and registration in air traffic charts is not sufficient, wind farm arrays could be marked by tethered balloons placed on the outlines of the array. Balloons and mooring lines of the balloons will be marked and lighted according to existing requirements. SkySails did not comment on the policy, other than to provide specifics on their system.

Windlift commented they are fully committed to working with FAA and NAS users to ensure aviation safety during the development of their systems but did not specifically comment on the policy. Windlift commented that their fabric wings can have bright colors embedded with reflective elements to maximize visibility. During night operations, Windlift's proposed system planned to use a conductive cable strung with the tether or a battery to power lights. Windlift commented that tether marking is a challenge to system performance due to increased drag and placing multiple flags within 75 feet of the aloft portion could provide a visual signal of the tether for pilots. Windlift proposed the use of LED lights instead of lights with more weight.

V. Additional Discussion

A 2021 Department of Energy (DOE) report discusses U.S. locations where there is an increase in average wind speed with altitude up to approximately 300 meters (985 feet), above which the wind speed profile becomes mostly flat up to 500 meters (1640 feet).[8] DOE finds that most AWES will operate below 500 meters. Aloft portions of an AWES, including the tether or similar device connecting it to a ground station, above 499 feet AGL would be in airspace available to general aviation and must be readily identifiable so a pilot can see and avoid it. As part of FAA's aeronautical study conducted under part 77 and the process defined in FAA Order JO 7400.2, FAA may include marking and lighting recommendations in its determination.

Advisory Circular 70/7460–1 describes the FAA's standards for marking and lighting structures to promote aviation safety. Based on individual AWES characteristics, FAA may require marking and lighting applicable to specific systems to ensure visibility during varying weather conditions or night operations. FAA continues to research and test alternative marking and lighting for use by all components of an AWES (to include the aloft portion and the tether or similar device). Once the FAA identifies an acceptable standard, it may include it in AC 70/7460–1. Additionally, FAA must evaluate each AWES and issue a technical note approving the system's marking and lighting prior to a proposed AWES deployment and part 77 analysis.

As part of the part 77 evaluation, FAA will coordinate the proposal with potentially impacted air traffic control (ATC) facilities for local analysis, as required. If FAA determines the need for local coordination, each affected facility performs an operational safety analysis of the potential effects or risks of AWES operations to local air traffic. This analysis may also include AWES-specific considerations, *e.g.,* the aloft portion separating from the ground station or the duration required to recover the aloft portion to the ground station. If the local ATC facility discovers additional safety hazards, FAA may convene a local Safety Risk Management (SRM) panel to complete a safety analysis and document its findings in an SRM document. The SRM panel's findings could affect FAA's final determination. Additionally, FAA-issued final determinations for AWES proposals may include conditions for marking and lighting to ensure the structure is visible to aircraft operating in proximity to an AWES.

VI. Final Policy

Based on feedback received in response to the Notice, the FAA concludes that AWES may affect navigable airspace. As of the effective date of this policy statement, the FAA amends the policy set forth in the Notice and will consider part 77 applications for all AWES, including permanent and operational systems. Those entities proposing construction of an AWES that exceeds the parameters in section 77.9 (*e.g.,* an AWES constructed at more than 200 feet AGL at its site) must file advance notice with FAA.

FAA receipt of part 77 notices of proposed construction from all AWES will enable the continued development of this emerging technology while allowing FAA to study the potential impacts of each individually proposed AWES on the safety and integrity of the NAS. Further, this action ensures inclusion of AWES information in the FAA's publicly searchable obstruction database.[9]

Issued in Washington, DC, on December 20, 2022.

Michael R. Beckles,

Director (A), Policy, AJV–P.

[FR Doc. 2022–27993 Filed 12–22–22; 8:45 am]

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[8] *www.energy.gov/sites/default/files/2021-12/report-to-congress-challenges-opportunities-airborne-wind-energy-united-states.pdf.*

[9] *https://oeaaa.faa.gov/.*

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 97

[Docket No. 31460; Amdt. No. 4037]

Standard Instrument Approach Procedures, and Takeoff Minimums and Obstacle Departure Procedures; Miscellaneous Amendments

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: This rule establishes, amends, suspends, or removes Standard Instrument Approach Procedures (SIAPS) and associated Takeoff Minimums and Obstacle Departure procedures (ODPs) for operations at certain airports. These regulatory actions are needed because of the adoption of new or revised criteria, or because of changes occurring in the National Airspace System, such as the commissioning of new navigational