



✂ Noise News

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FAA Report to Congress on Alternative Noise Metrics

In a report published on April 14, 2020, the Federal Aviation Administration (FAA) responded to the requirement outlined in the FAA Reauthorization Act of 2018, Pub. L. 115254, § 188, Congress required the Federal Aviation Administration (“FAA”) that they “evaluate alternative noise metrics to current average day-night level standard, such as the use of actual noise sampling to address community airplane noise concerns.” The report gave an overview of the history and purpose of noise evaluation and provided detail on the alternative metrics considered.

The conclusion of the FAA’s report was to continue recommending the use of DNL for FAA decision-making regarding noise compatibility. This is a continuation of the decision reached in 1992, in the Federal Interagency Committee on Noise (FICON) report that was reaffirmed in 2018 with the successor to FICON, the Federal Interagency Committee on Aviation Noise (FICAN).

Source: FAA

FAA Notice of Proposed Rulemaking for Supersonic Aircraft Standards for Certification

In a press release dated March 30, 2020, the FAA stated that a major step was taken toward reintroducing supersonic commercial jet travel by

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way of a proposed rulemaking for noise certification standards for new supersonic aircraft. The Notice of Proposed Rulemaking (NPRM) serves the purpose of adding landing and takeoff noise standards for a certain class of new supersonic airplanes. It is available for public comment for 90 days after publication in the Federal Register (April 13, 2020). The public comment period closes on July 13, 2020.

The NPRM is based on a 2019 FAA proposed rule to update the requirements to apply for a special flight authorization for flying above Mach 1 in the United States, which was initiated for manufacturers interested in developing supersonic aircraft.

The press release also notes that the proposed rule accounts for the many advancements in aviation technology, including improved engine design and aircraft materials, since supersonic commercial air transportation was introduced in the 1970s.

The lack of noise standards for certification of supersonic aircraft up to this point has been a key obstacle to bringing these aircraft to market for manufacturers. Regulations require that aircraft meet standards for certification, so the absence of such standards prevents supersonic aircraft from receiving approval.

The NPRM establishes subsonic landing and takeoff cycle standards, including a maximum takeoff weight no greater than 150,000 pounds and a maximum operating cruise speed of Mach 1.8. Aircraft meeting this requirement would be certified under “Supersonic Level 1.” This would accommodate most current development activity by manufacturers, though the FAA has stated that they envision future rulemaking for designs that advance beyond that category.

According to studies done by NASA, the proposed takeoff and landing cycle limits would exceed the current Stage 4 standards. However, they differ from the Stage 5 standards due to “unique technological and design requirements for supersonic aircraft to maintain long-distance supersonic flight,” according to the FAA. These design requirements include fuselage, wing shape, and variations in engine characteristics.

FAA stated that the NPRM is designed to “to allow the maximum latitude for these designs while they are still in their infancy.” The proposal provides a way to certify these aircraft, but only for noise produced by subsonic operation in the U.S. It does not address the noise produced from flights at cruise altitudes or at supersonic speeds nor does it alter the current ban on the creation of sonic booms over land. This is because FAA lacks sufficient data for developing those standards for supersonic aircraft and instead, the agency states that more research is required for rulemaking.

The Supersonic Level 1 proposed standard would serve as a baseline for developing and adopting standards for future classes of supersonic aircraft, like those with maximum takeoff weights over 150,000 pounds.

The FAA developed this proposed rule due to manufacturer request as well as a congressional directive for the FAA to take a leadership role in supersonic policy. Publication of the NPRM in the Federal Register, as well as the 90-day public comment period, are necessary steps in developing a regulatory basis for certification of supersonic aircraft.

Sources: FAA and AIN Online

COVID-19 Impacts

Noise Benefits of Optimizing Flight Paths

As expected, European air traffic volumes are down considerably due to the coronavirus pandemic. Airlines and air navigation service providers (ANSPs) have taken this opportunity to launch an environmental initiative. This initiative facilitates ‘perfect flights’ by optimizing flight paths. This is being led by Civil Air Navigation Services Organization (CANSO) in association with International Air Transport Association (IATA), Airlines for Europe (A4E), European Regional Airline Association (ERA), Airlines International Representation in Europe (AIRE), International Federation of Air Traffic Controllers' Associations (IFATCA) and the Eurocontrol Network Manager.

ANSPs normally apply airspace restrictions to maximize capacity, reduce complexity, and organize aircraft into specific flows to manage traffic safely and efficiently into and out of busy airspace. According to Eurocontrol, flights are down about 87.0% from 2019 levels. As a result, most airspace restrictions can be lifted, enabling more direct routes and use of optimal vertical profiles. The optimization of flight paths reduces fuel burn, emissions, noise, and fuel costs therefore provides environmental and economic benefits.

Source: Greenaironline.com

Increased Speed of Airport Renovations

Across the U.S., the temporary lull in air traffic due to COVID-19 has resulted in several airports increasing the tempo of airport renovations. Boston Logan International Airport (BOS), New York's Westchester County Airport (HPN), and Kentucky's Owensboro-Daviess County Regional Airport (OWB) have all sped up construction in recent months.

Boston Logan International Airport

Massport has chosen to begin a runway rehabilitation project on Runway 9/27 which was originally set to start at the end of August, after what would normally be a busy summer travel season. Due to the slowdown, Runway 9/27, a 7,001-foot runway and the fourth longest at BOS, will undergo a full closure for several weeks to accommodate the rehabilitation work. This began on May 26, 2020

The project will include:

- New pavement;
- New electrical infrastructure, including energy-efficient LED lighting;
- Drainage improvements to eliminate ponding of standing water; and,
- Realignment of Taxiway D1 at the Runway 27 end to conform with current FAA safety standards.

The rehabilitation is projected to be complete in 73 days, meaning Runway 9/27 will reopen in early August.

Kentucky's Owensboro-Daviess County Regional Airport

OWB is using the Covid-19-induced slowdown to up the tempo of infrastructure projects, including the rehabilitation of the airport's primary 8,000-foot Runway 18/36, which was completed in May as a part of the airport's 10-year master plan update.

After the conclusion of the Runway 18/36 rehabilitation, construction work at the airport quickly shifted to repair concrete and replace panels on the 5,000-foot crosswind Runway 06/24, resulting in a closure of about two weeks. The airport has shifted to a 24-hour a day work schedule, which saves 30 days off the construction.

OWB also has a project underway which will improve access for the airport's rescue and firefighting crews via the building of a new service road. Expediting construction during the slowdown will serve to make things easier and more convenient for airport tenants and users.

New York's Westchester County Airport

Management at HPN decided to accelerate the construction schedule for the rehabilitation of its primary runway (the 6,500-foot Runway 16/34), due to the reduction in traffic from the COVID-19 pandemic. Initial plans called for nightly closures of the runway but due to the slowdown, the runway was closed entirely for several periods, including a four-day period between April 21-25, 2020. There was also an extended closing between April 27 and May 21, 2020 to mill the existing pavement, install asphalt leveling course pavement and install final asphalt pavement wear course, along with other peripheral runway markings and equipment.

Additionally, the entire airport was closed to fixed-wing traffic from April 29 through May 5, when Runway 11/29 was also closed while work is conducted on the intersection.

While the airport did not take these runway closures lightly, the goal of expediting construction is to reduce impacts to operations when air traffic returns to the 'new normal.'

Source: AIN Online

Electric and Hybrid-Electric Aviation

Research Insight

Riboldi et. al. published an article titled “Predicting the effect of electric and hybrid-electric aviation on acoustic pollution” in *De Gruyter’s Noise Mapping* journal on April 13, 2020. The research describes the promise of electric and hybrid-electric aircraft to provide a substantial contribution to the reduction of noise pollution and notes that there is a gap in demonstrating this promise. The goal of Riboldi, et. al.’s research is to address that gap by providing a methodology to quantify noise emissions from these novel powertrains. According to the researchers, this research is fundamental for assessing the potential for electric and hybrid-electric aircraft to reduce noise pollution.

The article provides a possible procedure for assessment, using a step-by-step conceptual and practical procedure. It is primarily focused on propeller-driven GA-aircraft, but easily scaled for heavier aircraft categories. The assessment procedure includes a noise prediction model that has been built that considers airframe (with sub-components), propeller, engine, electric motor and gearbox.

Following validation of the model based on real flights of conventionally propelled aircraft as well as the Pipistrel Panthera Hybrid, one of the few manufactured hybrid-electric aircraft currently, the researchers used their predictive model to demonstrate the noise reduction possible from electric and hybrid-electric aircraft.

Source: De Gruyter

EASA Certification of First Fully Electric Plane World-Wide

On June 10, 2020, the European Union Aviation Safety Agency announced the certification of the Pipistrel Velis Electro. This is the first certification in the world of a fully electric aircraft. It marks an exciting breakthrough in the pursuit of environmentally sustainable aviation as well as a

step toward the promise of reduced noise pollution with this new technology.

The Velis Electro is a two-seater aircraft from the Slovenia-based Pipistrel, which specializes in energy-efficient and affordable high-performance aircraft. The Velis Electro is primarily intended for pilot training.

EASA and Pipistrel were able to collaborate to complete the certification process in less than three years, with the common goal of ensuring the aircraft met the high standard of safety needed for certification. The collaboration on this project provided important lessons that will serve future certifications of electrically powered engines and aircraft.

EASA certified the electrical engine, the E-811-268MVLC, that powers the aircraft on May 18, 2020, the first of its kind.

Source: EASA

Aircraft Development and Testing

Cessna E-Caravan

On May 28, 2020 at 8:00 am Pacific Standard Time, magniX conducted the first flight test of the 750-horsepower magni500 all-electric propulsion system on a Cessna 208B Grand Caravan in Moses Lake, Washington. In partnership with AeroTEC, magniX has been working to convert the Cessna 208B Grand Caravan to an all-electric, low operating cost, clean aircraft.

The Cessna 208B Grand Caravan is one of the world’s most used middle-mile turboprop aircraft, so demonstrating the ability to convert it to an all-electric aircraft is another step toward environmentally sustainable aviation and noise reduction.

NASA’s X-57 Maxwell

On June 8, 2020, NASA announced significant progress in preparation for NASA’s first all-electric X-plane, the X-57 Maxwell.

Testing is underway and nearing completion for the X-57's functional ground testing as well as assembly and qualification testing for critical components, like the electric cruise motors and high-aspect ratio wing, as NASA progresses toward taxi testing and first flight.

The X-57 is modified from a Tecnam P2006T airplane. The modification is currently in its first of three configurations as an all-electric aircraft, before its final configuration which will include the high-aspect ratio wing. The current configuration replaces the standard combustion, 100-horsepower Rotax 912S engines with 60-kilowatt electric cruise motors. However, upcoming X-57 test flights in this phase will be flown using the vehicle's standard wing. The next phase will replace the standard wing with the high-aspect ratio wing. This will reduce overall vehicle area, and relocating the cruise motors out to the wingtips. The final configuration following the high-aspect ratio wing will be the addition of 12 smaller high-lift motors along the wing's leading edge to be activated during takeoff and landing.

Final steps in the airworthiness process will include endurance and high-power testing of the cruise motors and cruise motor controllers. This process includes small checks, low power checks, a variety of detail checks on the motor, and includes testing full mission profiles and beyond mission profiles to push the limits of temperature and power in a controlled environment.

To this point, the motors have performed "exceedingly well" with room for improvement, according to NASA.

Additionally, NASA hopes to use lessons learned and information gathered during critical component testing to help set certification standards for electric aircraft of the future as the X-57 approaches its historic first flight.

Sources: EASA, magniX, and NASA

Other Noise News

- In a ruling filed on June 19, 2020, a Jefferson County District Judge ordered that Denver International Airport (DIA) pay 33.5M for noise violations occurring between 2014 and 2017. Adams County, along with Thornton, Aurora, and Brighton sued the airport in 2018.
- San Fernando Valley Task Force, made up of members representing U.S. Sens. Dianne Feinstein and Kamala Harris and U.S. Reps. Adam Schiff, Brad Sherman, Ted W. Lieu and Tony Cardenas, wrote to the FAA urging the agency to take steps to reduce aircraft noise around Hollywood Burbank and Van Nuys airports. The task force identified areas where stricter adherence to traffic management procedures could lead to a meaningful reduction in noise.
- National Business Aviation Association (NBAA), Aircraft Owners and Pilots Association (AOPA), Experimental Aircraft Association (EAA), and six other aviation groups representing the industry signed a letter opposing the Aircraft Noise Reduction Act, a bill introduced by U.S. Rep. Joe Neguse (D-Boulder) in December 2019. The primary reason for opposition is that this bill would "create a patchwork of conflicting local regulations, jeopardize safety and create an economic burden on the aviation community."
- On June 30, the International EPD® System, an environmental declaration program based in Sweden, and Bombardier Aviation announced the first Environmental Product Declaration (EPD) in the business aviation industry for Bombardier's Global 7500 jet. This discloses fully transparent environmental information about product life cycle, water consumption, and other key environmental impact indicators, including noise emissions.