National Aeronautic Association

U.S. Department of Transportation
Docket Operations
West Building Ground Floor, Room w12-140
1200 New Jersey Avenue, SE.
Washington, DC 20590

Submitted Electronically

RE: Petition for Exemption from 14 CFR, Sections 91.151(a)(1) and 91.151(b)

Dear Sirs:

The National Aeronautic Association (NAA) hereby petitions the FAA for exemption from Section 91.151(a)(1) and 91.151(b) of Title 14 of the Code of Federal Regulations (14 CFR) so that competitors in the NAA Pulitzer Electric Aircraft Race (Pulitzer Race) flying electric propulsion aircraft may be permitted to carry an equivalent energy reserve less than the visual flight rules' fuel requirements while participating in Pulitzer Electric Aircraft Race event. Because previous petitioners have been granted exemptions similar in all material respects to this one (see FAA Exemption 5745 and subsequent renewals), and because granting this petition would not set a precedent, we request a Summary Grant of Exemption.

Regulation

Title 14, Section 91.151 of the Code of Federal Regulations states:

"(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and assuming normal cruising speed –

(1) During the day, to fly after that for at least 30 minutes; or

(2) At night, to fly after that for at least 45 minutes.

(b) No person may begin a flight in a rotorcraft under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, to fly after that for at least 20 minutes."

Extent of Relief Sought

We seek an exemption from 14 CFR Section 91.151(a)(1), and Section 91.151(b) to permit participants in the NAA Pulitzer Electric Aircraft Race flying aircraft with electric propulsion systems to begin flight in an airplane or rotorcraft (including non-traditional multi-rotor configurations), when there is enough energy reserve on board the aircraft, considering local, enroute and destination conditions affecting energy consumption, to take off, fly to the first point of intended landing, and during the day to fly after that for an additional 15 minutes at normal cruising speed, subject to the following conditions and limitations:

1. This exemption applies only to participants in the NAA Pulitzer Electric Aircraft Race and during the dates specified for that event and while traveling to and returning from the Pulitzer race.
2. This exemption is applicable for flight under day VFR conditions.

3. This exemption is applicable only for flights with planned durations of 90 minutes or less.
4. Weather at the destination airport from takeoff to 1 hour after the estimated time of arrival must be forecast to have a ceiling at least 2000 feet above the airport elevation and visibility of at least 3 statute miles (including temporary conditions).
5. Pilots exercising the reduced reserve requirements of this exemption must include the following remark on IFR or VFR flight plans: "Operating under FAA exemption [XXXX] for reduced reserve requirements."
6. Pilots exercising the reduced reserve requirements of this exemption must advise towered airports (other than the departure airport), ATC facilities and other traffic at uncontrolled airports (on Common Traffic Advisory Frequency (CTAF)) on initial contact that they are operating under FAA exemption [XXXX] for reduced reserve requirements.
7. This exemption is applicable to aircraft with a means to display available energy reserves installed in the aircraft and visible to the pilot.
8. Each pilot participating in the Pulitzer Race event must be given a formal briefing by the event organizer on the use, conditions and limitations of this exemption.

Reasons for Seeking Relief

Background. The Pulitzer Electric Aircraft Race is planned for May 16-19, 2022 as a 1000 nautical mile cross-country event beginning at Eppley Airfield, Omaha, NE, and ending at the Dare County Regional Airport near Kitty Hawk, NC. The route through the Midwest and Southeast part of the United States was chosen to be over benign terrain and have a large number of available airports near the route centerline. A cross-country format rather than a closed-circuit speed event was selected for the air race in order to emphasize electric aircraft range and reliability in addition to speed in a realistic operating environment.

The race will be open to piloted aerodynes of all types using electric propulsion (i.e. fixed wing aeroplanes, traditional rotorcraft, or multi-rotor Advanced Air Mobility (AAM) and electric Vertical Takeoff and Landing (eVTOL) vehicles). For the purpose of the Pulitzer race, the electric propulsion system must be zero emission to emphasize reduction of aviation carbon emissions through green technologies. Under this construction, battery powered, solar, fuel cell or similar propulsion systems would be eligible, but hybrid systems using reciprocating or turbine engines and hydrocarbon-based fuels to power electric generators would not be eligible.

Rationale. There are many electric aircraft research and development projects which are in flight trials and a few in the certification process. Electric propulsion systems offer significant operational, safety, cost and environmental advantages over traditional combustion propulsion systems using hydrocarbon-based fuels. These include lower operating costs which would allow more of the public to participate in aviation, lower maintenance costs due to the relative simplicity of electric motors versus reciprocating or turbine combustion engines, improved safety due to greater redundancy inherent in electric propulsion systems (less chance for asymmetric or total engine failure), and of course the obvious reduction or elimination (depending on the source of electric power) of CO_2 and other greenhouse gas emissions.

However, despite the other advantages of electric propulsion, the persistent challenge and barrier to entry for commercial electric aircraft has been the energy density required to achieve useful flight

range. Now that electric propulsion systems, aviation batteries and aviation qualified hydrogen fuel cells are making steady technical progress, there is utility to providing a public forum like the Pulitzer Electric Aircraft Race to demonstrate electric aircraft in a realistic operational setting. To provide the most benefit, the event is designed to encourage participation by a wide variety of vehicles and ensure a diversity of design.

The rationale for the exemption request is to mitigate the impact of the 30 minute reserve (20 minutes for rotorcraft) requirement on the number and diversity of race participants who may use aerodynes of limited range. Some entrant aerodynes may be of such limited range that the 30 minute reserve would effectively preclude their participation. Although most electric aircraft are capable of flying a course between the start and finish points of the Pulitzer race segments compatible with their range, the 30 minute flying time reserve may exclude some participants. Instead, by using operational controls included with this request to ensure safety, a greater number of teams will be capable of participating.

Reasons Why Granting the Exemption Would Not Adversely Affect Safety

Similar exemptions have been previously granted pursuant to petitions by the International Aerobatic Club (IAC), a division of the Experimental Aircraft Association (EAA). That exemption from Section 91.151(a)(1) of Title 14, Code of Federal Regulations (14 CFR) permits IAC and IAC members participating in IAC-sponsored competitions to begin a daytime flight in an aircraft under visual flight rules (VFR) conditions with enough fuel to fly for at least 10 minutes after the first point of intended landing. A public interest was demonstrated for IAC events and safety was not compromised in the granting of these previous exemptions. (Note: Although the text of the regulation and the previous exemptions are specific to "fuel" requirements, we contend that the intent of the regulation is to have a reserve of flying time, whatever the energy source or propulsion system.)

The operations conducted under these previously granted exemptions were different from the operations contemplated under the NAA's petition because they were conducted at or near an airfield which was normally used for both the takeoff and landing. The NAA's petition would apply to a cross country operation. We believe these operations can be conducted at a level of safety equivalent to normal general aviation VFR flights given the conditions and limitations included above.

The proposed conditions and limitations in the petition address the two primary safety concerns requiring a fuel, or in the case of electric aircraft, energy reserve - a destination airport runway suddenly and unexpectedly made unusable and weather below VFR minimums.

A runway becoming suddenly unavailable could occur for several reasons such as an accident, a runway incursion, or a disabled aircraft or vehicle on the runway. However, this is a rare event. In conducting research for this petition, we looked for airport runway data related to a sudden and unexpected runway closure. We did not find any relevant data. Nor did we find any data regarding aircraft accidents where the primary cause was fuel exhaustion due to an unavailable runway. Most fuel exhaustion accidents were caused by gross errors during refueling, failure of fuel monitoring systems, or failure of the pilot in command to properly monitor available fuel. This leads us to conclude that an aircraft accident caused by fuel exhaustion following a sudden and unexpected runway closure is a rare event.

If a landing runway is suddenly closed, there are a number of options ATC and pilots can exercise to ensure a safe landing including, landing on another runway, landing on a portion of the runway not

affected by the cause of the closure (similar to land and hold short), landing on a taxiway or other hard surface area of the airport, or making a landing in an unobstructed, non-hard surface area of the airport. In the case of the IAC exemption, a 10 minute fuel reserve was deemed sufficient to make a go-around (assuming the worst case situation where the closure happens while the exempted aircraft is on short final), coordinate landing plans and priorities with ATC (tower) or other aircraft at an uncontrolled airport, and fly a landing pattern to one of the alternate landing areas described above. In our request, we have increased the energy reserve by 50% over the previously approved IAC exemption to 15 minutes due to the nature of the cross-country flight and as an additional safety buffer.

Considering the weather requirements in the proposed limitations for the requested exemption, having a destination airport go below VFR weather minimums would also be very unlikely. The electric aircraft participating in the Pulitzer race, which would benefit from this exemption have relatively short range, and would plan on short flights of less than 90 minutes. Weather at the destination must be forecast to be at or above a 2000-foot AGL ceiling and 3 miles visibility for the entire portion of the flight, including temporary conditions. With the ability to monitor weather on a cockpit display or a handheld device readily available, the chances that a pilot will be surprised by suddenly deteriorating weather conditions are very low.

Our conclusion is that the requested relief, considering the nature of the Pulitzer race and the proposed limitations, results in a level of safety that is equivalent to the level of safety provided by 14 CFR 91.151 during normal general aviation day VFR cross-country flights.

Reasons Why Granting this Request Would Be in the Public Interest

There is a public interest, acknowledged by current and past Administrations, to reduce carbon emissions. The FAA also has a number of programs designed to reduce aviation's greenhouse gas emissions and impact on the environment. Therefore, programs which promote public understanding, public acceptance and technological improvements of zero-emission electric aviation have a clear public interest.

The Pulitzer Electric Aircraft Race is planned to be a resumption of the Pulitzer air races first held by the NAA, as the marquee event of the National Air Races in the 1920s. The primary mission of NAA is the "advancement of the art, sport, and science of aviation and space flight by fostering opportunities to participate fully in aviation activities and by promoting public understanding of the importance of aviation and space flight to the United States." The NAA intends for the Pulitzer Electric Aircraft Race to become a venue and showcase for the advancement of practical electric propulsion aircraft in terms of speed, distance and reliability, much like the national air races of the 1920's and 1930's helped promote the technological advances of airplanes at the beginning of aviation. The Pulitzer Electric Aircraft Race will also promote public acceptance by demonstrating practical electric aviation in a real world, cross-country format.

The requested exemption would also allow the FAA to examine new formulations of 14 CFR 91.151 for future rulemaking applicable to electric aircraft at a small scale and in a controlled environment before widespread use of electric vehicles. Advanced Air Mobility and eVTOL vehicles in particular are intended for commercial operations on relatively short-range fights similar to what would be needed to compete in the Pulitzer race. With proper coordination, the NAA could work with the FAA to collect data on

energy reserve remaining at landing from competitors making use of the exemption. This data might be useful to the FAA for future safety analyses and future rulemaking.

With the requested relief allowing robust participation by a diversity of aircraft designs, the Pulitzer Electric Aircraft Race and the associated Pulitzer STEM Challenge together will foster growth in the electric aviation industry and inspire STEM students towards careers in aviation.

Summary to Publish in Federal Register

Petitioner: National Aeronautic Association (NAA)

Sections of the FAR Affected: 14 CFR 91.151(a)(1) and 91.151(b)

Description of Relief Sought: To permit registered competitors in the NAA Pulitzer Electric Aircraft Race, when participating in the race or traveling to or from the race, to begin a flight in an aircraft under visual flight rule conditions, during the day, when there is enough fuel to be able to fly to the first point of intended landing and to be able to fly, thereafter, for at least 15 minutes, subject to certain conditions and limitations.

We appreciate your consideration of this petition. Should you have any questions please do not hesitate to contact our Director for the Pulitzer Electric Aircraft Race, Col Scott Neumann, USAF (ret) (email: scott_neumann@msn.com; ph. (301) 503-2911).

Sincerely,

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