Shield AI
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May 30, 2023

U.S. Department of Transportation
Docket Management System
West Building Ground Floor, Room W12-140
1200 New Jersey Ave., SE,
Washington, DC 20590

Subject: Revised Shield AI Petition for Exemption in Accordance with Title 14, Code of Federal Regulations (C.F.R.) Part 11 to Authorize Operation of the V-BAT UAS Under a Special Airworthiness Certificate – Experimental Category

To Whom it May Concern:

Pursuant to 14 C.F.R. Part 11, Shield AI Inc. (Shield AI – Parent Company to Martin UAV LLC), hereby applies for a Grant of Exemption from the Federal Aviation Regulations (FARs) identified below to allow Shield AI to operate its V-BAT Unmanned Aircraft System (UAS) with a Special Airworthiness Certificate - Experimental Category (SAC-EC) and an Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA) for purposes of research and development (R&D), showing compliance with regulations, crew training, exhibition, and market surveys in accordance with 14 C.F.R. §§ 21.191(a), 21.191(b), 21.191(c), 21.191(d), and 21.191(f), respectively. Shield AI intends to pursue type certification of the V-BAT UAS and the proposed operations under the SAC-EC will support type certification efforts for the V-BAT UAS.

This Petition is a revision of the Petition submitted by Shield AI on February 15th, 2023 and supersedes the original request.

The proposed operations will be the same as authorized under previous SAC-EC's (such as for N929WJ) and existing COAs (such as 2021-CSA-89-SAC) and will be conducted in accordance with the operating limitations of future applicable SAC-ECs and ATO issued COAs.

In support of this Petition for Exemption, Shield AI is submitting the following associated UAS operating documents:

- Shield AI V-BAT Unmanned Aircraft Flight Operator Manual
- Shield AI V-BAT Unmanned Aircraft Maintenance Manual
- Shield AI V-BAT Program Letter
- Shield AI V-BAT Operational Risk Assessment
- Shield AI V-BAT Special Airworthiness Certificate for N929WJ

These documents were previously submitted on a confidential basis under separate cover pursuant to 14 C.F.R. § 11.35(b), as the documents contain confidential commercial and proprietary information of Shield AI. The information contained in this material is not generally available to the public and is protected from release under the Freedom of Information Act, 5 U.S.C. § 552 et seq.

I. BACKGROUND OF PETITIONER AND DESCRIPTION OF PROPOSED UAS OPERATIONS

Shield AI's mission is to protect service members and civilians with intelligent systems. Shield AI is a venture-backed company built around a team of proven executives, warfighters with relevant national security experience, and world-class engineers focused on bringing self-driving technology to unmanned systems. The company is headquartered in San Diego, CA with satellite offices across the United States. Shield AI manufactures and operates small and medium UAS used for ISR operations, including the V-BAT UAS.

The V-BAT is a long endurance, confined space, autonomous Vertical Takeoff and Landing (VTOL) UAS which can execute point takeoffs and landings without the need for launch and recovery equipment. The V-BAT is the technological leader in Group 3 UAS – simple logistics and ease of operation in a range of missions, domains, and conditions effect this advantage. The V-BAT's platform foundations, on their own, far exceed hybrid quad-rotor VTOL platforms and legacy catapult launched UAS' ability to support expeditionary and maritime operations.

The V-BAT is currently in service within the Department of the Navy and International customers. Shield AI has obtained SAC-EC's for several of its Company Owned V-BAT UAS and intends to apply for additional V-BAT UAS SAC-ECs. The V-BAT Program Letter and Safety Checklist associated with the existing SAC-EC have been reviewed and accepted by the Fort Worth MIDO and North Texas FSDO, and the system has completed a Safety Evaluation. Shield AI is in the process of renewing these SAC-ECs with the North Texas FSDO.

As discussed more fully in the attached Shield AI V-BAT Program Letter, the proposed operations will occur in rural, sparsely populated areas, including (but not limited to):

- Brushy Creek, TX
- Olney, TX
- Choctaw, OK
- Bonham, TX (COA Pending)

The proposed operations and the relief sought in this Petition for Exemption will support essential research and development (R&D), showing compliance with regulations, crew

training, exhibition, and market surveys which need to occur before Shield AI can pursue type certification of the V-BAT UAS.

Pursuant to 14 C.F.R. § 11.81(a), the contact information for Petitioner is as follows:

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II. DESCRIPTION OF UAS

The Shield AI V-BAT is a single engine, Vertical Takeoff and Landing (VTOL), propeller driven ducted fan UAS designed for surveillance. The aircraft is configured with one internal combustion engine and has backup battery power to maintain system functionality for safety of flight in the event of a total power loss. The V-BAT aircraft's structure is primarily carbon fiber and measures approximately 9 feet in length with an approximate 10-foot wingspan. The maximum gross takeoff weight is 125 pounds including fuel and payloads. Additional proprietary details regarding the design and operation of the Shield AI V-BAT are in the Shield AI V-BAT Flight Operator Manual submitted under separate cover.

III. REGULATIONS FROM WHICH EXEMPTION IS SOUGHT

Pursuant to 14 C.F.R. § 11.81(b) Shield AI seeks an exemption from the following provisions of 14 C.F.R. Parts 61 and 91:

FAR	Description
§ 61.3(a)(1)(i)	**Requirement for certificates, ratings, and authorizations**
§ 91.121	**Altimeter settings.**
§ 91.403(b)	**General**
§ 91.405(a)	**Maintenance required**
§ 91.407(a)(1)	**Operation after maintenance, preventive maintenance, rebuilding, or alteration.**
§ 91.417(a)	**Maintenance Records**
§ 91.417(b)	**Maintenance Records**

Pursuant to 14 C.F.R. § 11.81(b), 11.81(c), and 11.81(e), listed below are the specific Federal Aviation Regulations (FARs) sections from which an exemption is sought, the rationale for why an exemption is needed, and a brief summary of the operating procedures and safeguards (described more fully in the operating documents being submitted under separate

cover) which will ensure that the proposed operations can be conducted at a level of safety that is at least equal to that provided by the rule from which exemption is sought.

A. § 61.3(a)(1)(i) Requirement for certificates, ratings, and authorizations

Shield AI requests an exemption from FAR § 61.3(a)(1)(i), which requires that a person serving as a required pilot flight crewmember of a civil aircraft holds a pilot certificate issued under this part and in accordance with § 61.19. Given the unique design and highly-automated operation of the V-BAT UAS, the training and knowledge requirements associated with holding a crewed pilot certificate issued under Part 61 are unnecessary. As described more fully in the Shield AI V-BAT UAS Training Syllabus submitted under separate cover, Shield AI has developed an extensive training program consisting of both ground and flight training appropriate for UAS.

Shield AI's V-BAT UAS specific pilot training requirements in its training program will ensure that the pilot in command has the training and skills necessary to safely operate the V-BAT, and will therefore ensure an equivalent or greater level of safety. Consistent with previously granted exemptions, specifically Exemption #19139 (KIWI TECHNOLOGIES, INC. D/B/A GUARDIAN AGRICULTURE), Shield AI believes an exemption from the requirements of FAR § 61.3(a)(1)(i) is appropriate.

B. § 91.121 Altimeter settings

Shield AI requests an exemption from FAR § 91.121 Altimeter settings, which requires a person operating an aircraft to maintain cruising altitude or flight level by reference to an altimeter that is set to the elevation of the departure airport or barometric pressure. In previously issued Exemptions, the FAA stated that an equivalent level of safety to the requirements of FAR § 91.121 can be achieved in circumstances where the PIC uses an alternative means for measuring and reporting UA altitude, such as global positioning system (GPS). The V-BAT UAS relies on a combined GPS and pressure altitude solution which initializes to ground level at takeoff. This solution, coupled with the requirement to remain in the local area (to allow constant visual line of site of an observer on the ground) provide an accurate altitude indication in the Ground Control Station at the operating area. Consistent with previously granted exemptions, specifically Exemption #19139 (KIWI TECHNOLOGIES, INC. D/B/A GUARDIAN AGRICULTURE), these requirements ensure that an equivalent level of safety will be achieved, and an exemption from the requirements of FAR § 91.121 is therefore appropriate.

C. § 91.403(b): General
§ 91.405(a): Maintenance required
§ 91.407(a)(1): Operation after maintenance, preventive maintenance, rebuilding, or alteration
§ 91.417(a): Maintenance Records

§ 91.417(b): Maintenance Records

Shield AI requests an exemption from FAR § 91.403(b); General, FAR § 91.405(a); Maintenance required, FAR § 91.407(a)(1); Operation after maintenance, preventive maintenance, rebuilding, or alteration, and FAR § 91.417(a) and (b); Maintenance Records. These regulations specify maintenance and recordkeeping requirements which reference Part 43 which, according to FAR Part 43.1(b)(1), does not apply to an aircraft for which the FAA has issued an experimental certificate. Compliance with these regulations for a non-type certificated UAS operation is not feasible.

It should be noted that an equivalent level of safety to these maintenance and recordkeeping requirements will be achieved because these activities will be performed in accordance with the Shield AI V-BAT Operations and Maintenance Manuals, provided under separate cover. Specifically, in compliance with the V-BAT Operations Manual requirements, the V-BAT pilot will conduct a pre-flight inspection of the UAS and all associated equipment to account for all discrepancies and/or inoperable components. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft will be prohibited from operating until the necessary maintenance has been performed and the aircraft is found to be in a condition for safe flight. A functional test flight will also be conducted in a controlled environment following the replacement of any flight critical components and, as required by the operating documents, the pilot who conducts the functional test flight will make an entry in the V-BAT aircraft records of the flight. In addition, Shield AI will comply with the maintenance and inspection requirements for the V-BAT and its components as described in the Maintenance Manual. Records of all maintenance (scheduled and unscheduled) as well as records of accrued hours on the airframe and engine are maintained in the aircraft logbook through the life of the aircraft. Consistent with previously granted exemptions, specifically Exemption #19139 (KIWI TECHNOLOGIES, INC. D/B/A GUARDIAN AGRICULTURE), complying with these measures by Shield AI will achieve a level of safety equal to or greater than that required by the FAR, and an exemption from the requirements of FAR § 91.403(b), FAR § 91.405(a), FAR § 91.407(a)(1), and FAR § 91.417(a) and (b) is therefore appropriate.

D. Others

Shield AI has attempted to identify the appropriate FARs from which an exemption is needed to conduct the proposed operations in this Petition for Exemption. To the extent that the FAA determines that Shield AI needs an exemption from other FARs which are not addressed or explicitly named, Shield AI also seeks an exemption from those FARs for the reasons outlined above.

IV. PUBLIC INTEREST

Pursuant to 14 C.F.R. § 11.81(d), Shield AI believes our proposed activities are in the public interest. Specifically, under the SAC-EC Shield AI will be able to further product maturation,

safety enhancements, and mature a pathway to commercial and governmental use of the V-BAT. It is expected the V-BAT will provide the ability to survey large areas (such as pipelines, powerlines, railroads, wildfire / disaster areas, maritime environments, etc.) at a very economical cost.

In addition to being economical, surveying these large areas will be able to be accomplished with an increased margin of safety using remote pilots and aircraft automation, allowing the aircrew to remain safely on the ground. Furthermore, with no exposed blades or quadrotors, V-BAT's enclosed single propeller ducted fan offers a safe operating environment which allows ground personnel to work less than one meter from the aircraft during ground operation, launch, and recovery and eliminates the need for safety barriers or other special safety equipment be emplaced during takeoff and landing to protect or reduce risk to ground personnel that are operating or observing the aircraft.

The activities conducted under this SAC-EC will also help inform the process for a potential Section 44807 exemption request to authorize commercial applications for the V-BAT.

V. FEDERAL REGISTER SUMMARY

Pursuant to 14 C.F.R. § 11.81(f), the following summary is provided for publication in the FEDERAL REGISTER, should it be determined that publication is needed:

Petitioner seeks an exemption from the following rules in Title 14 of the Code of Federal Regulations:

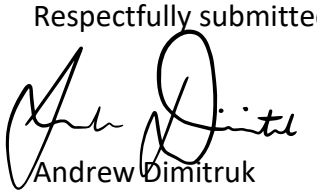
§ 61.3(a)(1)(i), § 91.121, § 91.403(b), § 91.405(a), § 91.407(a)(1), § 91.417(a), and § 91.417(b).

Shield AI Inc. seeks relief from these rules to obtain a Special Airworthiness Certificate – Experimental Category to operate the Shield AI V-BAT Unmanned Aircraft System to conduct research and development (R&D), showing compliance with regulations, crew training, exhibition, and market survey activities in the United States. The Shield AI V-BAT is a single engine, Vertical Takeoff and Landing (VTOL), propeller driven ducted fan UAS designed for surveillance. The V-BAT aircraft's structure is primarily carbon fiber and measures approximately 9 feet in length with an approximate 10-foot wingspan. The maximum gross takeoff weight is 125 pounds including fuel and payloads. All operations will occur during daylight hours and within visual line-of-sight of a trained pilot in command and a visual observer.

VI. CONCLUSION

For the foregoing reasons, Shield AI respectfully requests that the FAA grant this Petition for Exemption. Should you have any questions, or if you need additional information to support Shield AI's Petition, please do not hesitate to contact the undersigned.

Respectfully submitted,



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