Department of Energy
Brookhaven Site Office
P.O. Box 5000
Upton, New York 11973

January 10, 2020

Mr. Steven Coleman
Assistant Laboratory Director, Environment, Safety and Health Directorate
Brookhaven Science Associates, LLC
Brookhaven National Laboratory
Upton, New York 11973
Delivered via email

Dear Mr. Coleman:

SUBJECT: DRONE OPERATIONS AT BROOKHAVEN NATIONAL LABORATORY

Reference: Email from A. Janczewski, BHSO, to F. Horn, BSA, Subject: FW: sUAS Approved Guidance from OAM dated December 9, 2016.

This letter is to address the safe and efficient operations of drones defined as "unmanned aircraft" on the Brookhaven National Laboratory (BNL). A Certificate of Waiver or Authorization (COA) for Unmanned Aircraft or Unmanned Aircraft Systems (UAS) was issued to the United States Department of Energy and for use by its Contractors. A copy of the COA was transmitted to Brookhaven Science Associates (BSA) by way of email from the Brookhaven Site Office (BHSO) including guidance and requirements for operating UASs in the National Airspace System as referenced above.

Since the issue of the original COA, the COA has been renewed and contains new Federal Aviation Administration (FAA) requirements and is provided herein as attachments 1 through 3. BHSO recognizes that the transmittal of the original COA did not follow a formal notification or review process. Therefore, BHSO would like to meet with BSA's Prime Contract Manager, Requirements Management, and any applicable personnel as you deem appropriate to discuss the FAA requirements, and a formal mechanism for the transmittal and disposition of future COA's, or whether an existing BSA process is appropriate.

If you have any questions regarding this letter, the point of contact is the undersigned and can be reached at extension 7812, or Fausto.Fernandez@science.doe.gov.

Sincerely,

Fausto R. Fernandez
Contracting Officer
Business Division

Attachments:
1. FAA Blanket COA
2. DOE sUAS COA Monthly Report
3. sUAS Airworthiness Declaration

cc: B. Gordon, SC-BHSO
M. Dikeakos, SC-BHSO
A. Janczewski, SC-BHSO
A. Clifton, SC-BHSO
M. McCann, SC-BHSO
J. Anderson, BSA
K. Fox, BSA
F. Horn, BSA

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO
Department of Energy (DOE) Part 91

ADDRESS
HQ, US DOE
1000 Independence Ave, SW
Washington, DC 20585

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED
Operation of small Unmanned Aircraft Systems (UASs) weighing less than 55 pounds and operating a speeds of less than 87 kts in Class G airspace for the purpose of public aircraft operations.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE
N/A

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions are set forth on the reverse side hereof.

The certificate is effective from October 8, 2019, through October 7, 2021, and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

BY DIRECTION OF THE ADMINISTRATOR

Asia L Hunter
Digitally signed by Asia L Hunter
Date: 2019.10.08 09:25:29 -04'00'

FAA Headquarters
(Region)

Asia L Hunter
(Signature)

October 8, 2019
(Date)

Acting Manager, UAS Policy-P22
(Title)

FAA Form 7711-1 (7-74)

Purpose: To prescribe UAS operating requirements in the National Airspace System (NAS) for the purpose of public aircraft operations. The holder of this COA will be referred herein as the "Proponent".

Public Aircraft:

1. A public aircraft operation is determined by statutes, 49 USC §40102(a)(41) and §40125.
2. All public aircraft flights conducted under a COA must comply with the terms of the statutes.
3. All flights must be conducted per the declarations submitted in the application, and as specified in the following Standard/Special Provisions.
4. This COA provides an alternate means of complying with 14 CFR §91.113(b) for unmanned aircraft operations.
5. All operations will be conducted in compliance with Title 14 CFR §91 and the conditions of the authorization issued herein. If the operator cannot adhere to any of these requirements a separate FAA Form 7711-2 Waiver application may be required.

STANDARD PROVISIONS

A. **General.**

1. The review of this activity is based upon current understanding of UAS operations and their impact in the NAS. This COA will not be considered a precedent for future operations. As changes occur to policy, procedures, and regulatory requirements, limitation and conditions for UAS operations will be adjusted.
2. All personnel connected with the UAS operation must read and comply with the contents of this authorization and itsprovisions.
3. A copy of the COA, including the special limitations, must be immediately available to all operational personnel at each operating location whenever UAS operations are conducted.
4. This authorization may be cancelled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be cancelled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The proponent will receive a written notice of cancellation.
5. During the time this COA is approved and active, a site safety evaluation/visit may be accomplished to ensure COA compliance, assess any adverse impact on ATC or airspace, and ensure this COA is not burdensome or ineffective. Deviations, accidents/incidents/mishaps, complaints, etc., will prompt a COA review or site visit to address the issue. Refusal to allow a site safety evaluation/visit may result in cancellation of the COA. **Note**: This section does not pertain to agencies that have other existing agreements in place with the FAA.
6. Radiofrequency spectrum authorization is independent of the COA process and requires the proponent to obtain equipment certification and frequency assignments (licenses) in the Aeronautical Radio navigation, Aeronautical Mobile (Route), or Aeronautical Mobile Services, as appropriate, from the National Telecommunications and Information Administration (NTIA) for all radiofrequency devices, including the control link, ATC radios, transponders, detect and avoid systems, and navigation systems, used to support this COA (47 CFR Part 300).

B. **Airworthiness Certification.**

The Unmanned Aircraft System will be maintained in a condition for safe operation while conducting operations in the NAS. The proponent has made their own determination that the unmanned aircraft is airworthy. The unmanned aircraft system must be operated in strict compliance with all provisions and conditions contained in the Airworthiness Safety Release, including all documents and provisions referenced in the COA application.

C. **Operations.**

1. The UA must be operated within visual line of sight (VLOS) of the Pilot in Command (PIC) and the person manipulating the flight controls at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses. Although the remote PIC and person manipulating the controls must maintain the capability to see the UA, using one or more visual observers (VO)'s allows the remote PIC and person manipulating the

controls to conduct other mission-critical duties (such as checking displays) while still ensuring situational awareness of the UA.

2. Must yield right of way to other aircraft, manned or unmanned.
3. First-person view camera cannot satisfy "see-and-avoid" requirement but can be used as long as requirement is satisfied in other ways.
4. Maximum altitude of 1200' above ground level (AGL). In all cases, the UAS must remain within Class G airspace.
5. Minimum visibility of 3 statute miles from control station.
6. No person may act as a remote pilot in command or VO for more than one unmanned aircraft at one time.
7. No operations from a moving vehicle or watercraft unless the operation is over a sparsely populated area and the PIC and VO are co-located.
8. Lost link must remain within visual line of sight of the PIC and VO.
9. The remote pilot in command must:
   a. Make available to the FAA, upon request, the small UAS for inspection, and any associated documents/records required to be kept under the rule.
   b. Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation.
10. The remote pilot in command may deviate from the requirements of this rule in response to an in-flight emergency.
11. Tethered operations must adhere to the Obstruction Marking and Lighting Requirements of AC No: 70/7460-1L. Standards for marking and lighting obstructions that have been deemed to be a hazard to navigable airspace.

D. **Notice to Airmen (NOTAM).**

1. A Distant (D) NOTAM must be issued prior to conducting UAS operations not more than 72 hours in advance, but not less than 24 hours for UAS operations prior to the operation for routine operations. This requirement may be accomplished:
   a. Through the proponent's local base operations or (D) NOTAM issuing authority, or
   b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867). The issuing agency will require:
      (1) Name and contact information of the pilot filing the (D) NOTAM request
      (2) Location, altitude and operating area
      (3) Time and nature of the activity.
2. The area of operation defined in the (D) NOTAM must only be for the actual area to be flown for each day defined by a point and the minimum radius required to conduct the operation.
3. Operator must cancel (D) NOTAMs when UAS operations are completed or will not be conducted.
4. <u>For first responders only.</u> Due to the immediacy of some emergency management operations, the (D) NOTAM notification requirement may be issued as soon as practical before flight

and if the issuance of a (D) NOTAM may endanger the safety of persons on the ground, it may be excluded. If the (D) NOTAM is not issued, the proponent must be prepared to provide justification to the FAA upon request.

E. **Reporting Requirements.**

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates. NOTE: Negative (zero flights) reports are required.
2. The Proponent must submit the following information on a monthly basis through CAPS:
   a. Name of Proponent, and aircraft registration number,
   b. UAS type and model,
   c. All operating locations, to include city name and latitude/longitude,
   d. Number of flights (per location, per aircraft),
   e. Total aircraft operation hours,
   f. Takeoff or landing damage, and
   g. Equipment malfunction. Required reports include, but are not limited to, failures or malfunctions to the:
      (1) Control station
      (2) Electrical system
      (3) Fuel system
      (4) Navigation system
      (5) On-board flight control system
      (6) Powerplant
   h. The number and duration of lost link events (control, performance and healthmonitoring, or communications) per UAS, per flight.
3. Incident/Accident/Mishap Reporting
   a. The proponent must provide initial notification to the FAA via email at mail at 9-AJV-115-UASOrganization@faa.gov and via the COA Application Processing System forms (Incident/Accident) within 24 hours of an incident or accident that meets the following criteria:
      (1) All accidents/mishaps involving UAS operations where any of the following occurs:
         (a) Fatal injury, where the operation of a UAS results in a death occurring within 30 days of the accident/mishap
         (b) Serious injury, where the operation of a UAS results in:
            - Hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received;
            - A fracture of any bone (except simple fractures of fingers, toes, or nose);
            - Severe hemorrhages, nerve, muscle, or tendon damage;
            - Involving any internal organ; or

- Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

(c) Total unmanned aircraft loss

(d) Substantial damage to the unmanned aircraft system where there is damage to the airframe, power plant, or onboard systems that must be repaired prior to further flight

(e) Damage to property, other than the unmanned aircraft.

(2) Any incident/mishap that results in an unsafe/abnormal operation including but not limited to

(a) A malfunction or failure of the unmanned aircraft's on-board flight control system (including navigation)

(b) A malfunction or failure of ground control station flight control hardware or software (other than loss of control link)

(c) A power plant failure or malfunction

(d) An in-flight fire

(e) An aircraft collision involving another aircraft.

(f) Any in-flight failure of the unmanned aircraft's electrical system requiring use of alternate or emergency power to complete the flight

(g) A deviation from any provision contained in the COA

(h) A deviation from an ATC clearance and/or Letter(s) of Agreement/Procedures

(i) A lost control link event resulting in

- Fly-away, or
- Execution of a pre-planned/unplanned lost link procedure.

b. Initial reports must contain the information identified in the COA On-Line Accident/Incident Report.

c. Follow-on reports describing the accident/incident/mishap(s) must be submitted by providing copies of proponent aviation accident/incident reports upon completion of safety investigations.

d. The above procedures are not a substitute for separate accident/incident reporting required by the National Transportation Safety Board under 49 CFR Part 830 §830.5.

e. For other than Department of Defense operations, this COA is issued with the provision that the FAA be permitted involvement in the proponent's incident/accident/mishap investigation as prescribed by FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting

F. **Registration.**

The proponent must comply with the aircraft registration and marking requirements set forth in 14 CFR Parts 47 and 45, or Part 48, prior to conducting flight operations authorized by this COA. Title 49 United States Code (49 USC) sections 44101 through 44104 contain the laws requiring aircraft registration in the United States.

G. **Night small UAS Operations.**

Small UAS operations may be conducted at night, as defined in 14 CFR § 1.1, provided:

1. All operations under the approved COA must use one or more VO;
2. Prior to conducting operations that are the subject of the COA, the remote PIC and VO must be trained to recognize and overcome visual illusions caused by darkness, and understand physiological conditions which may degrade night vision. This training must be documented and must be presented for inspection upon request from the Administrator or an authorized representative;
3. The sUA must be equipped with lighted anti-collision lighting visible from a distance of no less than 3 statute miles. The intensity of the anti-collision lighting may be reduced if, because of operating conditions, it would be in the interest of safety to do so.

H. **Minimum Safe Altitude Operations.**

A waiver from the requirements of 14 CFR 91.119(b) and (c) is approved as follows:

1. The groundspeed of the small UAS must not exceed 100 mph/87 knots.
2. Except for those operations where it is necessary to safeguard human life, no person may operate a small unmanned aircraft over a human being unless that human being is:
   a. Directly participating in the operation of the small unmanned aircraft; or
   b. Located under a covered structure or inside a stationary vehicle that can provide reasonable protection from a falling small unmanned aircraft.

   Note: People "directly participating in the operation of the small unmanned aircraft" may include qualified non-crewmembers, as defined in 49 USC 40125.
3. For those operations where it is necessary to operate over a human being in order to safeguard human life, the remote pilot in command must not operate any lower or in proximity to human beings necessary to accomplish the operation.

I. **Special Use Airspace.**

1. Coordination and de-confliction between Military Training Routes (MTR) and Special Use Airspace (SUA) is the operator's responsibility. When identifying an operational area the operator must evaluate whether an MTR or SUA will be affected. In the event the UAS operational area overlaps an MTR or SUA, the operator will contact the scheduling agency as soon as practicable in advance to coordinate and de-conflict. Approval from the scheduling agency is required for regulatory SUA, but not for MTR's and non-regulatory SUA. If no response to coordination efforts, the operator must exercise extreme caution and remain vigilant of all MTRs and/ or non-regulatory SUAs.
2. Scheduling agencies for MTRs are listed in the Area Planning AP/1B Military Planning Routes North and South America. If unable to gain access to AP/1B contact the FAA at email address mailto:9-AJV-115-UASOrganization@faa.gov with the IR/VR routes affected and the FAA will provide the scheduling agency information. Scheduling agencies for SUAs are listed in the FAA JO 7400.8.

AIR TRAFFIC CONTROL SPECIALPROVISIONS

A. **Flight Planning Requirements.**

Operations must only be conducted beyond the following distances from the airport reference point (ARP) of a public use airport, heliport, glider port, or water landing port listed in the Airport/Facility Directory, Alaska Supplement, or Pacific Chart Supplement of the U.S. Government Flight Information Publications:

1. 5 nautical miles (NM) from an airport having an operational control tower, or
2. 3 NM from an airport having a published instrument flight procedure, but not having an operational control tower, or
3. 2 NM from an airport not having a published instrument flight procedure or an operational control tower, or
4. 2 NM from a heliport.

B. **Emergency/Contingency Procedures.**

1. Lost Link Procedures:

   In the event of a lost link, the UAS pilot will comply with the following provisions:

   a. The UA lost link will be programmed to ensure that lost link flight does not fly over persons and the landing location is within the view of the PIC.

   b. Rally and home locations will be programmed to remain within the area defined in the NOTAM where flight operations are being conducted.

   c. Lost link procedures will not transit or orbit over populated areas, Victor airways, or busy roadways/interstate highways.

   d. Lost link procedures will be programmed to remain within the operations area and altitude, avoid unexpected turn-around and/or altitude changes, and will provide sufficient time to communicate with ATC if necessary.

2. Emergency/Fly-Away Procedures:

   a. In the event of an emergency, the PIC will immediately contact the ATC facility having jurisdiction for the airspace, state the nature of emergency and pilot intentions.

   b. In the event of a UA fly-away, advise ATC of thefollowing:

      (1) Direction of flight.

      (2) Last know altitude.

      (3) Maximum remaining flight time.

AUTHORIZATION

This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations not specifically stated, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the proponent to resolve the matter. This COA does not authorize flight within Temporary Flight Restrictions, Special Flight Rule Areas, regulatory Special Use Airspace or the Washington DC Federal Restricted Zone (FRZ) without pre-approval. The proponent is hereby authorized to operate small Unmanned Aircraft System in the NAS within the areas defined in the Operations Authorized section of the cover page.

DEPARTMENT OF ENERGY NATIONWIDE sUAS COA MONTHLY REPORT (PUBLIC OPERATIONS)

REPORT DATE→		FOR THE MONTH OF→		SUBMITTED BY→		
COA ID #→	2019-AHQ-907-COA-REVISED				ENTER YOUR NAME	ENTER YOUR FIELD ELEMENT NAME
PROPONENT→	GLEN F. WATTMAN					(EXAMPLE: LANL, SRS, ETC.)
CONTACT INFORMATION→	(202)586-5532					

THIS REPORT IS DUE TO OAM NO LATER THAN THE 10TH OF EACH MONTH

AIRCRAFT							LOCATION		COORDINATES		
MANUFACTURER	MODEL	DATE OF FLIGHT	AIRCRAFT OPERATIONAL HOURS		GCS OPERATIONAL HOURS	PILOT DUTY TIME	CITY	STATE	LATITUDE	LONGITUDE	TOTAL # FLIGHTS
		TOTAL HOURS→	0	TOTAL HOURS→	0					TOTAL # FLIGHTS→	0

LOST COMM EVENTS

DATE	TYPE OF EVENT	DESCRIPTION OF EVENT

MALFUNCTION REPORTING

EQUIPMENT MALFUNCTIONS	TOTAL #→	
LOST LINK EVENTS	TOTAL #→	
DEVIATIONS FROM ATC INSTRUCTIONS/MOU'S/COA	TOTAL #→	
TAKE OFF OR LANDING DAMAGE (ENTER BRIEF EXPLANATION) →		

ANY OTHER OPERATIONAL/COORDINATION ISSUES EXPERIENCED DURING THIS REPORTING PERIOD NOT CAPTURED ABOVE

Department of Energy
Washington, D.C.
October XX, 2019

This letter is to address the Department of Energy's UAS Airworthiness Certification of the {Name of the UAS} Unmanned Aircraft System (UAS) operated by {Name of your individual organization}.

This Airworthiness of the {Name of the UAS} has been determined to be airworthy based on the intended use as advertised by {Name of the Manufacturer} subject to the warranties and representations offered by {Name of the Manufacturer}.

The Department of Energy field element operating the UAS will maintain a continuous Airworthiness program that includes maintenance and training on the UAS and will be maintained in an airworthy condition to conduct flights in the National Airspace System.

The point of contact for {Name of your organization} is {Name of the Point of Contact, email address and phone number},

Signature

NAME OF ACCOUNTABLE EXECUTIVE
{Name of your organization}