

DOE-ID NEPA CX DETERMINATION

Idaho National Laboratory

SECTION A. Project Title: UAS Flight Testing and Sensor Integration

SECTION B. Project Description and Purpose:

The INL Unmanned Aircraft Systems (UAS) team has over 65 years of combined experience in both classified and non-classified sensor integration, testing, telemetry, and data collection/analysis using UAS systems have included multiple types of visual and nonvisual sensors and radios. Visual systems have included hyper-spectral, multi-spectral, and RGB line of sight analysis. Radio frequency analysis has included counter-drone radar analysis, radio frequency jamming, long range command and control validation, and encrypted communication development and testing. Other sensors tested include environmental conditions such as gathering wind information and radioactive fallout detection. INL receives requests to fly fixed wing and rotary wing UAS in support of the Department of Defense (DOD), Department of Energy (DOE), Department of State (DoS), other government agencies, academia, and private industry. INL continues to receive requests to support UAS training activities for government agencies and conduct flights for internal projects and programs for data collection. The collected experience and system integration support provided by the UAS team continues to draw new sponsors and opportunities.

A valuable asset that INL also has is the ability to leverage the INL Wireless Test Bed (WTB). Many UAS test sites (FAA and DOD) are often subjected to radio frequency interference due to their proximity to other locations (such as military bases or encroaching civilian populations). INL's inherently low RF noise floor, access to any frequency as a National Telecommunications and Information Administration (NTIA) Experimental Radio Station, and its ability to manage its own frequencies over a 980 square mile range is truly unique. This is a very powerful combination that continues to be in demand by many customers.

This umbrella scope of work covers several activities involving UAS flight testing and sensor integration using Class 1 (< 150 KG) or Class 2 (150-600 KG), fixed wing or rotary wing UAV, or lighter than air airships. This covers the operation of the UAV under remote control, supervised pilot in the loop control, and autonomous control (autopilot-controlled flight). Due to potential operational testing limitations (size of payload or required altitude of flight), manned aircraft may be used as a test platform and to test air-to-ground, air-to-air, and long-distance relay communications.

The area shown in Figure 1 is used for vehicle parking, equipment storage and staging, and depending on the weather, launching UAVs. The original pad area is where operations and equipment trailers are staged. Depending on an event, there will almost always be a control trailer and usually an equipment trailer. In the tent (soon to be replaced by a temporary metal structure) is where work is performed on UAVs, including changing out cameras or radios and performing preflight inspections on the UAVs before they are launched. All personnel are asked to stay on the gravel pads during normal operations.



Figure 1. UAS Operations Area

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The purpose of this umbrella scope is to utilize the capabilities of the UAS team as mentioned and allow customers to work with the UAS team to test and collect data for the equipment (from here on called a "Payload") they are working on. The payload brought will change depending on the customer.

The use of Unmanned Aerial Systems and Unmanned Ground Systems (UAS/UGS) to perform customer required testing, performance evaluation, and data collection/analysis include:

- o Counter-Drone/UAS/UAG testing and analysis operations. The payload would be ground or air based radar and RF frequency monitoring to track and jam signals of Drone.
- o Drone/UAS/UGS Intelligence, Surveillance, and Reconnaissance (ISR) Operations. The payload would be cameras and/or sensors placed on the UAS to detect ground activity.
- o Drone/UAS/UGS/Manned fixed wing aircraft payload development, testing and analysis operations to include testing visual and nonvisual sensors, payloads and communication systems development, testing and analysis operations, visual navigation computers, and other black boxes needing above ground analysis before being integrated into future planned system. The payload will include air to ground radio systems transmitting camera data, collecting Lidar images, or radar imaging.
- o Drone/UAS/UGS durability testing and analysis operations of payloads mentioned above..
- o Provide System and Design engineering in support of payload integration and UAS modifications.
- o Determine proper modifications to UAS for testing to include safety and hazard analysis as well as establish Size, Weight, and Power (SWaP) requirements to fulfill payload work requests.
- o System and component testing and analysis. Design and conduct UAS and sensor component and system testing, including test plan preparation, testing execution, sensor or payload data processing, test results analysis, and test reporting.
- o Define requirements for platform or payload integration, bench testing and operational testing of various components (e.g., visual camera payloads, radio testing, external detectors, Electronic Warfare components, etc.) against established specifications or requirements.
- o Performing analytical review of complete system and/or individual components of a larger system, and all related activities for above work requests.

Activities will be constrained to the INL Site (primarily centered around the UAS Runway) and to in-town REC facilities (Bonneville County Technology Center).

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

N/A

Discharging to Surface-, Storm-, or Ground Water

N/A

Disturbing Cultural or Biological Resources

Impacts to cultural resources have the potential to result from unexpected events, such as malfunction, when UAVs are forced to the ground to prevent leaving predetermined flight boundaries.

Although the chance for increased biological disturbance within the SGCA is minimal, there is the potential for some impact to wildlife and habitat during the course of the proposed action. Sage grouse could be impacted by noise and soil disturbance in the event of UAV malfunction.

Generating and Managing Waste

Typical municipal waste may be generated to include plastic bottles, paper, etc.

Releasing Contaminants

N/A

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Using, Reusing, and Conserving Natural Resources

Project description indicates materials will need to be purchased or used that require sourcing materials from the environment. Being conscientious about the types of materials used could reduce the impact to our natural resources.

SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification: Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.

For Categorical Exclusions (CXs), the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, or similar requirements of Department of Energy (DOE) or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

References: 10 CFR 1021, Appendix B to Subpart D, items B1.2 "Training exercises and simulations," B3.2 "Aviation activities," and B3.11 "Outdoor tests and experiments on materials and equipment components."

Justification: The proposed action is consistent with 10 CFR 1021, Appendix B to Subpart D categorical exclusion B1.2, "Training exercises and simulations (including, but not limited to, firing-range training, small-scale and short-duration force-on-force exercises, emergency response training, fire fighter and rescue training, and decontamination and spill cleanup training) conducted under appropriately controlled conditions and in accordance with applicable requirements;"

B3.2 "Aviation activities for survey, monitoring, or security purposes that comply with Federal Aviation Administration regulations;" and

B3.11, "Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components) under controlled conditions. Covered actions include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special nuclear, or byproduct materials may be used for nondestructive actions such as detector/ sensor development and testing and first responder field training."

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason L. Anderson, DOE-ID NEPA Compliance Officer on: 12/13/2021