



Valkyrie UAS Solutions

Operations Report for MHA Nation

September 19, 2024

Subject: Operations Report for Protocol Uncrewed Aircraft Systems (UAS) Flights between September 16 – 18, 2024

Summary: Valkyrie UAS Solutions had two (2) Swoop Aero Kite Aircraft with associated ancillary equipment (batteries, charging stations) to conduct protocol flights from Elbowoods Medical Clinic in New Town, ND to Twin Buttes, ND along a 34 mile Federal Aviation Administration (FAA) Approved Beyond Visual Line of Sight (BVLOS) waiver with only Visual Observers (VO) required for road crossing mitigation in New Town and Twin Buttes. The initial launch location in New Town was identified as a risk upon geolocation of the aircraft as construction that as planned to complete the week prior had been delayed due to weather. The Launch Location was adjusted slightly to the Veteran's Administration (VA) parking lot which was approximately 100' to the West and up a hill mitigating the operations over people.

- Pre-Flight: (September 10 – September 15, 2024)
Valkyrie Received 2 disassembled Swoop Aircraft shipped from Australia and Virginia. All Shipping was to NHS College in coordination with Kerry Hartman.
 - Batteries arrived via separate ground courier
 - Ancillary equipment to include necessary tools for battery construction shipped via United States Postal Service
 - Swoop Aircraft with associated assembly components and spare parts arrived via UPS freight

On-site assembly and verification required additional time due to the multiple shipping methods and delivery dates. Aircraft assembly and battery construction in field environments is not the Standard Operating Procedure (SOP)

- Check-Flight: (September 16, 2024: Notional Time: 10:10 – awaiting flight logs)
Valkyrie assembled, inspected and conducted a system verification to include both required hardware and software inspections. Once complete, Valkyrie conducted a Visual Line of Sight (VLOS) from the Earth Lodge.

Flight Time:	2 Minutes
Weather Conditions	Clear Skies, Winds at 12 Knots 20 Knot Gusts



Valkyrie UAS Solutions

Operations Report for MHA Nation

Communications Systems	Nominal Operating
Battery	No Significant Battery Consumption
Operations	Hub Operations supported by Rylee Dahlen and Amanda Brandt

Check-Flight was successful

- Protocol Flight #1: (September 17, 2024: Time: 10:25)
Valkyrie conducted a flight from New Town to Twin Butts to validate the flight route.

Note 1: The North Plains UAS Test Site deployed 7 additional Visual Observers beyond the issued FAA UAS Waiver Requirements.

Note 2: DeTect Systems deployed 3 radar systems not required by the FAA UAS Waiver Requirements

Flight Time:	.5 hours
Weather Conditions	Dense Fog from 6:00 am to 11:00 am delayed launch
Communications Systems	Loss-Link of notionally 22 seconds occurred due to rugged topology, cloud cover and fog – will confirm with flight logs
Battery	Battery at Landing 54% Remaining

The aircraft launched and operated nominally for the 30 minute flight. During the inbound landing process at Twin Buttes, the aircraft could not locate the landing zone QR code. Per Standard Operating Procedure, the aircraft landed at the prescribed GPS landing point.

The aircraft missed the landing point by approximately 50 yards. Subsequent inspection identified that the revised landing locations and GPS did not load into the flight planning software causing the aircraft to land in the incorrect location.

Valkyrie team, supported by Swoop Aero (OEM) identified and corrected the issue. Additionally, Valkyrie conducted a full aircraft inspection to ensure safety for the September 18th Flight.

- Protocol Flight #2: (September 18, 2024: Time: 9:35)
Valkyrie conducted a flight from New Town to Twin Butts to validate flight operations and aircraft performance

Flight Time:	.65 hours
Weather Conditions	Wind Speeds and Gusts at aircraft limits of 25 Knotts



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Operations Report for MHA Nation

Communications Systems	Negligible Loss Link in the Mil-Second Range
Battery	Battery at Landing 46% remaining

The aircraft launched and operated nominally for the 23 minute flight to include landing on the target in Twin Buttes

Observations:

- **Mechanical:**
The shipping and assembly process consumed all spare parts and required additional tooling required additional time. The 2-week planning accommodated Valkyrie arriving 9 days before scheduled protocol flight was a critical success factor; however, improve shipping, assembly, tooling and spare parts are required. Once assembled the aircraft require minimal maintenance and repair.

Batteries were another challenge. We had several malfunctions with the batteries that are being phased out. There are new batteries that the OEM is moving to, however, the protocol flights occurred prior to the completion of the testing of the new batteries. The risk was too great to move to the new batteries prior to completing the testing.

- **Weather**
Weather limitations are a reality for all aircraft to include drones which impacted the demonstration operations due to the short timeline for execution.

For Protocol #1 flight, we had an aircraft ready for launch but had to wait for a weather window.

For Protocol Flight #2, we were able to synchronize both the aircraft and weather availability

Note: During daily Drone delivery operations, MHA Nation will be able to fly drones around weather time periods and pre-plan for upcoming storms

- **Communications**
Communications operated nominally within the Valkyrie Waiver Parameters

Impact:



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Operations Report for MHA Nation

Decreasing time from 1:45 minutes driving to 22-30 minutes by drone will provide enhanced medical and emergency response support from New Town to Twin Buttes will save lives. Additionally, the MHA Nation will develop a blueprint for drone healthcare delivery operations that will create economic development and growth.

Aircraft:

The aircraft flows with the Swoop Aero Kite platform. The specifications of the aircraft are below. The intended operational model is to have the main body of the aircraft always assembled only requiring the battery pods and wings to be installed prior to flight operations.



Kite™

Bringing together unparalleled operational experience and real-world learning, Kite™ is Swoop Aero's next generation urban aircraft, built for the skies above cities and regions alike.

Aircraft Category	Powered Lift eVTOL
Maximum T/O Weight	24.9 kg / 54.5 lbs
Cruise Speed	66 kts / 122 kmh
Max Speed	107 kts / 200 kmh
Environmental Limits	-5°C to 50°C
Altitude Limit	10,000' density altitude
Max Packed Dimensions	1.1m * 1.1m * 0.5m
Powertrain	Quad Electric batteries split into two independent battery packs, with dual chemistries

Range (all wind)	80 km heavy	125 km <55lb	125 km <55lb	225 km <55lb
Max Payload	6 kg	4.6 kg	3 kg	1 kg

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