

NASA LaRC Range Safety Commit Criteria

Introduction: In accordance with NPR8715.5 NASA Range Safety and LPR1710.16 LaRC Flight Operations, Chapter 5 for UAS, this document shall be used to establish commit criteria (GO / NO GO) for all untethered UAS flight range operations. These criteria are verified by a LaRC Range Safety Officer (RSO) in coordination with the respective UAS project management, the mission flight crew, and flight operation. A copy of this checklist shall be kept with the LaRC Range Safety Officer on file for a period of at least 3 years.

Scope: The items listed in this document cover all phases of the flight mission including pre-deployment, day of flight, and the flight operation. These commit criteria are satisfied by the appropriate notation and signature of the RSO or DRSR for that mission's Day of Flight Test Site / Safety Briefing Checklist. Items that do not apply shall be marked "N/A". Additional comments, notes, and line items may be added at the discretion of the RSO. Items that cannot be verified shall result in the mission being put on hold until completed or by work around decisions that are approved by the RSO focused at the following:

1. Make operational decisions needed to control risk prior to initiation of flight or each phase of flight
2. Each decision is based on a risk assessment that is conducted or revealed just prior to each phase of flight

Pre Deployment Criteria: sUAS Flight Mission Request and Approval (Ref. Data-at-a-Glance spreadsheet) Per LPR 1710.16; Chapter 5

Mission

- UAS Project: _____
- Defined Agenda
- Mission Location: _____
- Mission Start Date: _____
- Mission End Date: _____
- Mission Duration (Days): _____
- ASRB FTOSR Approval Current
- ASRB FSR Current
- ORR/MRR Completed- Details Available

Facility

- Facility / Air Space Agreement Current
- Radio Frequency Approvals Current
- NASA/FAA COA
- NASA/FAA MOA
- FAA Part 107

Flight Crew

- Flight Crew Staffing/Training Satisfied?
- Observers
- Pilot(s)
- Ground Station Operator(s)

Day of Flight Criteria

- Test Site / Safety Briefing Checklist
- Safety Barriers (if required)

Flight/Vehicle Operation Criteria

- Vehicle Airworthiness Requirement Satisfied
- Pre-flight Checklist available
- Operation Checklist available
- Post-flight Checklist available

Range Safety Ops Location Checklist

LOCATION: _____ **DATE:** _____ **TIME:** _____

Safety Officer: _____ **Test Manager:** _____

NOTATIONS: (check) = Approved; N/A = Not Applicable

INSPECTIONS:

- Facility Notified & Approval Received; Ref. Operations Plan for that location
- NOTAMs Filed, Flight operations and hazard areas reviewed
- Hand Held Com. Radios charged, Channel; _____, Radio Check performed
- CO2/Water Fire Extinguishers in working order (expiration date checked) & properly located
- Verify stopwatch and anemometer available and operational
- Remove FOD from engine start area, taxi area, takeoff and landing area
- Safety glasses, ear plugs/muffs, sunscreen, insect repellent & water ready for use
- Site Inspected for Trip Hazards, tools, equipment, generator & extension cords
- Emergency Vehicle properly located (with radio) & all other vehicles in designated area
- Visibility \geq 3 miles: _____ Cloud base ceiling $>$ 1,000 Ft.: _____
- Ops 500 Ft below Lowest Reported Cloud Altitude. (Class E Minimums)
- Wind chill \geq 38°F: _____ Temp. \geq 40°F: _____ Heat Index \leq 105° _____
- Surface wind condition limits; steady \leq 20 kts, gusts max 20 kts, 90° crosswinds \leq 12 knots.
- Surface Winds: _____ Gusts: _____ Time: _____
- Pilot & spectator barriers, road blocks and/or fencing properly installed if required.
- Spectator review area defined
- Hazard Area Clear; Team Members & Observers in Designated Areas
- Team / Safety meetings completed

TESTSITE Inspection Completed By: _____ **Time:** _____

<u>ECN</u>	<u>Partner Agency/Gov</u>	<u>Pilot</u>	<u>GSO</u>	<u>RSO</u>	<u>Research Sensors Used</u>	<u>Purpose of Data Collection</u>	<u>PII Collected</u>

NOTES: Including deviations

SAFETY BRIEFING

NOTATIONS: (X) = Approved N/A = Not Applicable

- Weather brief: Winds, temperature, chance of rain/thunderstorms or deviations.
- Heat, water, sunscreen, Ticks bug bites, ear protection, sunglasses / safety glasses.
- Review Communications procedures: clear and adequate for conditions.
- Flight operations transmitting frequencies: _____
- Qualified Spotter/Observer(s): _____
- GSO Elevation & Air speed call-out: _____
- Model Servicing (Batteries and Fuel) by: _____
- Model repair team: _____
- Cell phones (on vibrate) (OFF at Wallops) Calls during flight ops
- Safety Barriers pilot/guest locations (Only Mission Essential Crew on runway during Ops)
- Engine hazard area, empty pockets, pens, badges, loose clothing potential hazard
- Reminder to keep area free from clutter and trip hazards
- Reminder: No smoking or open flames around fuel or propane, well-ventilated area
- General Safety: Don't ignore problems/concerns
- Probable Emergency/ Hazard**
 - **Review - Lost Link, Geo-fence, Fire on Ground, Fire in Air**
- NASA Universal Knock it Off Policy Explanation
- Objectives / priorities for the day: _____
- Identify UAS to be flown today: _____

Pilot briefing of: Test Plans, Flight Cards, Flight Operations

- Pilot review of log book entries for all UAS flown today
- Flight Plan; maximum altitude for flight operations today; runway direction
- Preflight checklist completed

Review Pilot and Operations team safety and emergency procedures:

- Flight Test Cards for Emergency Procedures reviewed if applicable.
- Fire Extinguishers manned by: _____
- Emergency Response Team: _____
- Review: **Emergency of the day**; responsibilities, equipment; and vehicle location.

Pilot and Operations team Flight Ops Situational Awareness Discussion

- Define flight transition/activation areas; no fly areas
- Responsibilities of all attendees during each phase of flight (Take Off, Flight, Landing)
- New equipment and/or procedures addressed if required.
- Deviations from normal operating procedures addressed.

-) **Does anyone have anything to add regarding safety or today's flight (ask each person)**
-) **RSO Provides Final GO/NO-GO prior to each flight**
-) **RSO Approval to start Flight Operations**

RSO: _____, Time: _____

Flight Operations Log

Flight #	Pilot	UAS/Project	Flight Time
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Flight Operations Log Cont.

Flight #	Pilot	UAS/Project	Flight Time
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			