



## Unmanned Aircraft System (UAS) Flight Anomaly Report (Macro-free Version) General Information and Instructions

The information on this tab provides general information about this workbook and instructions for completing a report customized to the anomaly being reported. Guidance regarding individual questions in the report is provided in the user guide and via tooltips within the form. The tooltips will appear when the answer field in the form is selected.

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### Public Burden Statement

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All responses to this collection of information are required to obtain or retain a benefit (49 U.S.C. § 106(l) and (m)). Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

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### Introduction to the UAS Flight Anomaly Report

The UAS Flight Anomaly Report is a way for the UAS Integration Office and other Federal Aviation Administration (FAA) offices with the responsibility of safely integrating UAS into the National Airspace System (NAS) to gather data about minor unexpected events that occur during normal UAS operations. This data, when aggregated, will assist with setting performance standards, will inform future rulemaking, and may reveal questions to address to improve the safety of UAS operations in the NAS. This data will not be used in a punitive fashion against any participant in the BEYOND program or Partnership for Safety Program (PSP). Participants will not submit this report for every flight, only for flights in which an anomaly occurred.

**The UAS Flight Anomaly Report does not replace official accident and incident reporting requirements.** If an accident occurs that results in at least serious injury to any person or any loss of consciousness, or if it causes damage to any property (other than the UAS itself) in excess of \$500 to repair or replace the property (whichever is lower), report the accident to the FAA within ten days using DroneZone or by contacting the nearest Flight Standards District Office. Will Carry operators must report any dangerous goods incidents, discrepancies, and apparent violations in accordance with the Hazardous Materials Regulations.

**Design of the UAS Flight Anomaly Report**

The workbook contains multiple tabs:

- Instructions: This tab contains a summary version of the instructions in this user guide.
- Definitions: The definitions in Appendix A of the user guide are also provided in the workbook for ready reference.
- Assess: This is the starting point for submitting a UAS Flight Anomaly Report. The user answers the questions on this tab to identify which tabs to populate.
- General Info: The user must populate this tab in addition to the tabs identified on the Assess tab.
- 1-20: These tabs contain questions specific to each type of anomaly.

The tabs contain a combination of multiple-choice questions using drop-down boxes and open-ended questions with open text boxes. The user can view quick tips about each question by left-clicking once in the response field.

## **Generate the Custom UAS Flight Anomaly Report**

There are roughly 60 questions unique to specific types of anomalies. In order to prevent the user from searching through the entire set of questions in order to answer as few as 1 anomaly-specific question about a flight, the user begins the reporting process by identifying which tabs in addition to the General Info tab need to be populated. To complete an anomaly report, complete these steps:

1. Click the "Assess" tab.
2. Select all of the anomalies that occurred during the flight by clicking the checkboxes next to the applicable description.
3. If the answer to any of the seven shaded questions at the bottom of the form is yes, click the applicable checkbox.
4. Complete the "General Info" tab and the tabs listed in Column D of the "Assess" tab.
5. Save the file with a different filename in order to preserve both the original file and the newly-generated report for future use.

Instrument/UAS Flight Anomaly Report (no macros) (5/21)

## UAS Flight Anomaly Report Definitions

| Term   | Definition   | Source                             |
|--|--|------------------------------------|
| Accident [UAS]                               | An occurrence associated with the operation of any public or civil unmanned aircraft system that takes place between the time that the system is activated with the purpose of flight and the time that the system is deactivated at the conclusion of its mission, in which: (1) Any person suffers death or serious injury; or (2) The aircraft has a maximum gross takeoff weight of 300 pounds or greater and sustains substantial damage.   | 49 CFR 830.2                       |
| Anomaly [UAS]                                | An event (e.g., equipment malfunction or loss of a safety-critical communication or navigation link) that does not meet the reporting criteria of an accident, incident, or occurrence but adversely affects the operation of any public or civil unmanned aircraft system between the time that the system is activated with the purpose of flight and the time that the system is deactivated at the conclusion of its flight, in which (1) a mitigation strategy is executed (via application of technology and/or procedures); or (2) the aircraft exceeds its operational boundaries. | IPP Data Team<br>8/12/20           |
| Cargo  | Any property carried on an aircraft other than mail and accompanied or mishandled baggage.   | UAS FY19<br>Implementation<br>Plan |
| Control and Non-Payload Communication (CNPC) | The communication between the control station and the unmanned aircraft used to perform navigational functions, including mitigations and maneuvers.   | IPP Data Team<br>6/4/20            |
| Crewmember [UAS]                             | In addition to the crewmembers identified in 14 CFR part 1, a UAS flightcrew member includes pilots, sensor/payload operators, and VOs but may include other persons as appropriate or required to ensure safe operation of the aircraft.  | N 8900.227<br>(cancelled)          |
| Dangerous goods                              | See Hazardous material.  |                                    |
| Flight termination system                    | A system that terminates the flight of a UAS in the event that all other contingencies have been exhausted and further flight of the aircraft cannot be safely achieved, or other potential hazards exist that immediate discontinuation of flight.  | ASTM F3298-19                      |
| Flight time                                  | Pilot time that commences when an aircraft moves under its own power for the purpose of flight and ends when the aircraft comes to rest after landing  | 14 CFR 1.1                         |
| Flyaway                                      | When the pilot is unable to effect control of the aircraft and, as a result, the UA is not operating in a predictable or planned manner.   | JO 7200.23A                        |
| Hazardous material                           | A substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103).   | 49 CFR 171.8                       |

## UAS Flight Anomaly Report Definitions

| Term                             | Definition   | Source           |
|----------------------------------|--|------------------|
| Incident                         | An occurrence, other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.<br>Examples of serious incidents from NTSB Advisory to Operators of Civil Unmanned Aircraft Systems in the United States:<br>True "fly-away", inability of required flight crewmember to perform normal duties as result of injury or illness, inflight fire, aircraft collision in flight, >\$25K damage to objects other than the aircraft, aircraft is overdue and is believed to have been involved in an accident                                      | 49 CFR 830.2     |
| Minor [severity definition]      | Nuisance. Operating limitations. Use of emergency procedures. Minor incident.  | AC 107-2         |
| Negligible [severity definition] | Little consequence.  | AC 107-2         |
| Occurrence                       | An abnormal event, other than an accident or incident. Examples include: low speed aborts or air turnbacks.  | FAA Order 8900.1 |
| Parachute [UAS]                  | Any aerodynamic deceleration device designed to slow the descent of sUA when not under stable safe flight.   | ASTM F3322-18    |
| Parachute recovery system [UAS]  | Summation of the components of a parachute recovery system that work to reduce descent velocity.   | ASTM F3322-18    |
| Remote Pilot in Command (RPIC)   | Person who is directly responsible for and is the final authority as to the operation of the UAS; has been designated as remote pilot in command before or during the flight of a UAS; and holds the appropriate CAA certificate for the conduct of the flight.  | ASTM F3266-18    |
| Serious Injury                   | Any injury which: (1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.   | 49 CFR 830.2     |
| Substantial Damage               | Damage or failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered "substantial damage" for the purpose of this part. | 49 CFR 830.2     |
| Unmanned Aircraft (UA)           | An aircraft operated without the possibility of direct human intervention from within or on the aircraft.  | JO 7200.23A      |

## UAS Flight Anomaly Report Definitions

| <b>Term</b>                    | <b>Definition</b>  | <b>Source</b> |
|--------------------------------|--|---------------|
| Unmanned Aircraft System (UAS) | An unmanned aircraft and associated elements (including communication links and the components that control the unmanned aircraft) that are required for the pilot in command to operate safely and efficiently in the national airspace system. | JO 7200.23A   |
| Will Carry                     | The certificate holder has authorization to transport dangerous goods in its OpSpec.   | AC 121-40     |

## Unmanned Aircraft System (UAS) Flight Anomaly Assessment

Answer the questions on this sheet to determine which tabs in this workbook to complete in addition to the **General Info** tab. Then complete the **General Info** tab and all tabs listed in Column D.

Populate the  
General Info tab and  
these tabs:

Select the type of anomaly that occurred (select all that apply):

### Planned Flight Path Deviations

- The UA deviated from the planned flight path.  Yes
- The UA crossed the geofencing boundary.  Yes
- The UA landed outside the designated landing area.  Yes

### Unplanned Flight Terminations

- One or more critical aircraft components failed, resulting in terminating the flight.  Yes
- The control station malfunctioned, resulting in terminating the flight.  Yes
- The flight termination system failed to deploy when needed.  Yes

### Mitigations Required

- The cargo delivery system malfunctioned.  Yes
- The agricultural application system malfunctioned.  Yes
- The Global Navigation Satellite System (GNSS) link was lost long enough to trigger a mitigation response.  Yes
- Communication between crewmembers was lost long enough to trigger a mitigation response, including the use of backup communication devices.  Yes
- The Control and Non-Payload Communication (CNPC) link was lost long enough to trigger a mitigation response.  Yes
- The parachute failed to deploy.  Yes
- An anomaly, other than those listed above, triggered a mitigation response.  Yes

*Note: This includes lost communication with air traffic control. This also includes human errors that could lead to lessons learned regarding UAS design and/or flight procedures. (There will be no evaluation of individuals; the data will be analyzed at the aggregate level.)*

- Was unscheduled corrective maintenance required as a result of the anomaly?  Yes
- Did the flight termination system deploy?  Yes
- Did the flight termination system deploy unexpectedly?  Yes
- Did the parachute deploy?  Yes
- Did the parachute deploy unexpectedly?  Yes
- Was the unmanned aircraft carrying hazardous materials (HAZMAT) cargo?  Yes
- Was this a Part 135 flight?  Yes

Instrument/UAS Flight Anomaly Report (no macros) (5/21)



### Unmanned Aircraft System (UAS) Flight Anomaly Report

The data in this report will be used for trend analysis to identify lessons to apply as we continue to integrate UAS into the NAS.

If an accident occurs that results in at least serious injury to any person or any loss of consciousness, or if it causes damage to any property (other than the UAS itself) in excess of \$500 to repair or replace the property (whichever is lower), report the accident to the FAA within 10 days using DroneZone or by contacting the nearest Flight Standards District Office.

Will Carry: Report dangerous goods incidents, discrepancies and apparent violations in accordance with the Hazardous Materials Regulations (HMR).

|   |                             |  |
|---|-----------------------------|--|
| <b>Aircraft Nickname or Registration Number</b>   |                             |  |
| <b>Launch Date</b>  |                             |  |
| <b>Launch Time</b><br><i>(if using 12-hr clock, include "am" or "pm", as applicable)</i>                |                             |  |
| <b>Time of Anomaly (if known)</b><br><i>(if using 12-hr clock, include "am" or "pm", as applicable)</i> |                             | UTC  |
| <b>Geographical Coordinates of Anomaly (if known)</b>   |                             |  |
| <b>Anomaly Severity</b>   |                             |  |
| <b>Mission Type</b>   |                             | <i>These fields are not required if you use the Monthly Individual Flight Report instead of the Monthly Summary Flight Report.</i> |
|   | If Other, briefly describe. |  |
| <b>Flight Type</b>  |                             |  |

Instrument/UAS Flight Anomaly Report (no macros) (5/21)



**Flight Path Deviation**

Cause of Unplanned Flight Path Deviation

Did the UA exceed the approved altitude?

If Yes, for how long? (mm:ss)

Was the horizontal deviation greater than 50 feet?

### Geofencing Malfunction

What action took place upon the UA crossing the geofencing boundary?

If the automatic contingency system activated, identify the contingency action.

Did the UA return to within the geofencing boundary?

If No, identify any hazards or damage resulting from landing outside the geofencing boundary.

How long was the UA outside the geofencing boundary? (mm:ss)

## Designated Landing Area Deviation

How far from the designated landing area did the UA land?

What caused the UA to land outside the designated landing area?



## Aircraft Failure

Systems/Components in the category of aircraft failure include the frame, propulsion system, electrical system, aircraft-mounted safety-critical sensors, and cameras (if used as mitigation).

Which aircraft component(s) failed to operate as intended?

Describe the circumstances behind the aircraft failure.

### Control Station Malfunction

Only include malfunctions of devices that have the ability, or potential, to control the aircraft. Do not include malfunctions of informational stations.

Describe the circumstances leading to the control station malfunction, including the components involved if known (e.g., battery, software, sensor, etc.).

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## Flight Termination System Failed to Deploy

Describe the flight termination system installed on the aircraft.

Describe the circumstances leading to the failure of the flight termination system. If known, what caused the flight termination system to fail?

What corrective action was taken to minimize the risk of the same type of failure occurring again?

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### Cargo Delivery System Malfunction

Weight of Cargo Transported During Flight

If the weight is unknown, what is the maximum cargo weight allowed by the UAS in order to launch?

Describe the cargo delivery system.

Describe the circumstances leading to the cargo delivery malfunction, including the components involved if known.

What corrective action was taken to minimize the risk of the same type of malfunction occurring again?

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### Agricultural Application System Malfunction

Weight of Cargo Transported During Flight

If the weight is unknown, what is the maximum cargo weight allowed by the UAS in order to launch?

Describe the application/delivery system.

Describe the circumstances leading to the application/delivery system malfunction, including the components involved if known.

What corrective action was taken to minimize the risk of the same type of malfunction occurring again?

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## Global Navigation Satellite System (GNSS) Lost Link

GNSS Lost Link Latency Threshold (mm:ss)

Number of GNSS Lost Link Occurrences

For each GNSS lost link occurrence, enter the last known geographical coordinates before the GNSS lost link occurred.  
*(Populate the "9a" tab to add data about additional occurrences.)*

Latitude

Longitude

Altitude

Duration of GNSS Lost Link Occurrence (mm:ss)

Source of Geographical Coordinates

If "Other" selected, specify.

If the RPIC controlled multiple UA on the mission, how many UA were affected by the GNSS lost link?

GNSS Lost Link Procedure Performed

If "Other" selected, describe.

Unit of Measure

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### Global Navigation Satellite System (GNSS) Lost Link Addi

For each GNSS lost link occurrence, enter the last known geographical coordinates before the

| Latitude                                      | Longitude |
|---|-----------|
|   |           |
| Duration of GNSS Lost Link Occurrence (mm:ss) |           |

| Latitude                                      | Longitude |
|---|-----------|
|   |           |
| Duration of GNSS Lost Link Occurrence (mm:ss) |           |

| Latitude                                      | Longitude |
|---|-----------|
|   |           |
| Duration of GNSS Lost Link Occurrence (mm:ss) |           |

| Latitude                                      | Longitude |
|---|-----------|
|   |           |
| Duration of GNSS Lost Link Occurrence (mm:ss) |           |

**Additional Data**

GNSS lost link occurred.

| Altitude | Unit of Measure |
|----------|-----------------|
|          |                 |
|          |                 |

| Altitude | Unit of Measure |
|----------|-----------------|
|          |                 |
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| Altitude | Unit of Measure |
|----------|-----------------|
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| Altitude | Unit of Measure |
|----------|-----------------|
|          |                 |
|          |                 |

### Crewmember Communication Loss

What type of primary communication device did the crew use (cellphone, radio, etc.)?

If applicable, the crew used what type(s) of backup communication device?

Describe the circumstances leading to the loss of communication between crewmembers. If known, what caused the loss of communication?

How did the communication loss affect the aircraft?

If "Other" selected, describe.

What corrective action was taken to minimize the risk of losing primary communication among crewmembers again?

**Control and Non-Payload Communication (CNPC) Lost Link**

Number of CNPC Lost Link Occurrences

Longest Duration of CNPC Lost Link Occurrence  
(mm:ss)

If the RPIC controlled multiple UA on the mission, how many UA were affected by the CNPC lost link?

CNPC Lost Link Procedure Performed

If "Other" selected, describe.

## Parachute Recovery System Failed to Deploy

Describe the parachute recovery system installed on the aircraft.

Describe the circumstances leading to the failure of the parachute recovery system. If known, what caused the parachute recovery system to fail?

What corrective action was taken to minimize the risk of the same type of failure occurring again?

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**Other Anomaly**

Describe the anomaly.

If known, what caused the anomaly?

If applicable, what corrective action was taken to minimize the risk of the anomaly reoccurring?

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**Unscheduled Corrective Maintenance**

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Type of Unscheduled Corrective Maintenance

UAS Component(s) that Required Unscheduled Corrective Maintenance

Description of Unscheduled Corrective Maintenance

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### **Flight Termination System Deployed**

Describe the flight termination system installed on the aircraft.

Describe the circumstances leading to the deployment of the flight termination system. If known, what caused the flight termination system to deploy?

## Flight Termination System Deployed Unexpectedly

What corrective action was taken to minimize the risk of the flight termination system unnecessarily deploying again?

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### **Parachute Recovery System Deployed**

Describe the parachute recovery system installed on the aircraft.

Describe the circumstances leading to the deployment of the parachute. If known, what caused the parachute to deploy?

**Parachute Recovery System Deployed Unexpectedly**

What corrective action was taken to minimize the risk of the parachute recovery system unnecessarily deploying again?

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### HAZMAT Cargo Information

|  |  |
|--|--|
| UN #   |  |
| Proper Shipping Name   |  |
| Packing Group  |  |
| Inner Quantity   |  |
| Total Quantity   |  |
| What happened to the package/container (i.e., was it a hard landing, did it fall from cruise alt |  |
|  |  |
| Was any HAZMAT released?   |  |



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| itude, etc.)? |
|               |

## Part 135 Flight Information

|                       | Role                     |
|-----------------------|--------------------------|
| Number of Crewmembers | Pilot in Command         |
|                       | Visual Observer          |
|                       | Control Station Operator |
|                       | Manager                  |
|                       | Other                    |

If "Other" selected, describe.

If the pilot to aircraft ratio was greater than 1:1, what was the ratio?

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Number

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**Mission Type**

Aeronautical Research  
Agricultural Delivery/Application  
Agricultural Operation  
Environmental Survey  
Infrastructure Inspection (Linear)  
Infrastructure Inspection (Non-Linear)  
Package Delivery  
Public Safety  
Other

**Flight Type**

Operational  
Functional Check  
Training

**UOM Length**

CM - Centimeters  
FL - Flight Levels (hundreds of feet)  
FT - Feet  
IN - Inches  
KM - Kilometers  
M - Meters  
MI - Statute Mile  
NM - Nautical Miles  
SM - Standard Meters (tens of meters)

**UOM Weight**

G - Grams

KG - Kilograms

LB - Pounds

OZ - Ounces

**UOM Speed**

FT/S - Feet per Second

KT - Knots

KPH - Kilometers per Hour

M/S - Meters per Second

MPH - Miles per Hour

**Geofencing Action**

Automatic contingency system activated

Flight outside geofence area terminated only when UA power supply was consumed

RPIC initiated contingency procedure

**Automatic Contingency System**

Landed at waypoint

Landed in place

Returned to home

**GNSS Lost Link Procedures**

Continued pre-programmed flight

Hovered in place until connection reestablished

Reduced altitude

Entered a holding pattern until connection reestablished

Landed in place

Other

**CNPC Lost Link Procedures**

Entered a holding pattern until connection reestablished

Hovered in place until connection reestablished

Landed at alternate landing zone

Reduced altitude

Returned to home

Landed in place

Other



**Crewmember Comm Loss Effect**

Entered a holding pattern until connection reestablished

Hovered in place until connection reestablished

Returned to home

Landed in place

Other

**HAZMAT Quantity**

G - Grams

KG - Kilograms

LB - Pounds

OZ - Ounces

EA - Each

**Packing Group**

I: Substances presenting high danger

II: Substances presenting medium danger

III: Substances presenting low danger