Emergency Action Plan Template

# Contact Information

## UC Center of Excellence on UAS Safety

Contact Information

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## Campus Designated Local Authority

\*\*Enter Campus Name\*\*

\*\*Enter Contact information for Campus Point of Contact\*\*

# Flying Site Location

Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

GPS Coordinates: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_N, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_W

Nearest Intersection: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Directions to flying site from Intersection:

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# Non-Participant Enters Flight Area

* **Maintain** visual contact with UAS
* **Communicate** the situation to the Flight Crew
* **Verify**
	+ Check state of UAS (Status/Flight Mode)
	+ Check location of UAS in flight area
* **Take Actions**
	+ **Ground Crew** – Alert flight area, remove non-participant
	+ **Visual Observer** – Monitor air traffic
	+ **RPIC** – Pause flight operation and evaluate best course of action.
* **Issues**
	+ If non-participant is unable to be removed:
		- Stop flight operation until issue is resolved:
	+ If non-participant blocks landing location:
		- Locate suitable divert location
* **Post-Incident**
	+ Document incident
	+ Evaluate crowd control measures

# Hazardous Weather Conditions

* **Maintain** visual contact with UAS
* **Communicate** the situation to the Flight Crew
* **Verify**
	+ Check state of UAS (Status/Flight Mode)
	+ Check UAS location/altitude
* **Take Actions**
	+ **Ground Crew** – Review weather forecast
	+ **Visual Observer** – Monitor changing weather conditions
	+ **RPIC** – Evaluate if conditions exceed safe operating requirements
* **Issues**
	+ If weather conditions are changing rapidly:
		- Maneuver the UAS to a safe divert location
		- Land immediately
	+ Err on the side of caution:
		- Maneuver the UAS closer to RPIC to evaluate conditions
* **Post-Incident**
	+ Document incident

# Low Battery or Status Error

* **Maintain** visual contact with UAS
* **Communicate** the situation to the Flight Crew
* **Verify**
	+ Check state of UAS (Status/Flight Mode)
	+ Check location of UAS in flight area
* **Take Actions**
	+ **Ground Crew** – Alert flight area
	+ **Visual Observer** – Monitor air traffic and contact ATC if necessary
	+ **RPIC** – Determine safest landing location. Land as soon as possible.
* **Issues**
	+ If disoriented:
		- Use `Return to Home' to bring UAS back for landing
		- Regain visual contact with UAS as soon as possible
	+ If strong winds prevent return flight:
		- Use camera to locate suitable divert location
* **Post-Incident**
	+ Document incident
	+ Recovery telemetry logs
	+ Inspect UAS and battery for physical signs of damage

# Collision with Hazard

* **Maintain** visual contact with UAS
* **Communicate** the situation to the Flight Crew
* **Verify**
	+ Check state of UAS (Status/Flight Mode)
	+ Check UAS location/altitude
* **Take Actions**
	+ **Ground Crew** – Alert and clear flight area, prepare safety equipment
	+ **Visual Observer** – Guide RPIC around hazard
	+ **RPIC** – Establish positive control and land immediately
* **Issues**
	+ If the UAS regains stability and control:
		- Maneuver the UAS to a safe divert location
		- Land immediately
	+ If the UAS does not regain stability:
		- Initiate manual motor shutdown
* **Post-Incident**
	+ Document incident
	+ Inspect UAS and battery for physical signs of damage

# Fly Away/Loss of GPS

* **Maintain** visual contact with UAS
* **Communicate** the situation to the Flight Crew
* **Verify**
	+ Check state of UAS (Status/Flight Mode)
	+ Check UAS location/altitude
	+ Check transmitter/tablet status and control links
* **Take Actions**
	+ **Ground Crew** – Alert and clear flight area, prepare safety equipment
	+ **Visual Observer** – Monitor air traffic and contact ATC if necessary
	+ **RPIC** – Follow UAS and attempt to re-establish connection/positive control
* **Issues**
	+ If control is active, and UAS is drifting or moving incorrectly:
		- Lower altitude and attempt to keep UAS stationary
		- Try ‘Return to Home’ to bring UAS back for landing
		- Try switching control to ‘manual’ or attitude control
	+ If control is active but UAS is not responding:
		- Try switching control to ‘manual’ or attitude control
	+ If control is not active
		- Assist Ground Crew in alerting and clearing flight area
* **Post-Incident**
	+ Document incident
	+ Recovery telemetry logs
	+ Inspect UAS and battery for physical signs of damage

# Lost Link

* **Maintain** visual contact with UAS
* **Communicate** the situation to the Flight Crew
* **Verify**
	+ Check state of UAS (Status/Flight Mode)
	+ Check UAS location/altitude
	+ Check transmitter/tablet status and control links
* **Take Actions**
	+ **Ground Crew** – Alert and clear flight area, prepare safety equipment
	+ **Visual Observer** – Monitor air traffic and contact ATC if necessary
	+ **RPIC** – Follow UAS and attempt to re-establish connection/positive control
* **Issues**
	+ If telemetry is active, but video feed has failed:
		- Lower altitude and attempt to keep UAS stationary
		- Try ‘Return to Home’ to bring UAS back for landing
		- Try switching control to ‘manual’ or attitude control
	+ If telemetry/control is not active
		- Try restarting controller/tablet
		- Adjust antennas and attempt to improve connection while following UAS
		- Assist Ground Crew in alerting and clearing flight area
* **Post-Incident**
	+ Document incident
	+ Recovery telemetry logs
	+ Inspect UAS and battery for physical signs of damage

# In-Flight or Post-Flight Fire

* **Maintain** visual contact with UAS
* **Communicate** the situation to the Flight Crew
* **Verify**
	+ Check state of UAS (Status/Flight Mode)
	+ Check UAS location/altitude
	+ Check transmitter/tablet status and control links
* **Take Actions**
	+ **Ground Crew** – Alert and clear flight area, prepare safety equipment
	+ **Visual Observer** – Be prepared to call emergency services
	+ **RPIC** – Immediately terminate flight
* **Issues**
	+ If UAS sparks a ground fire:
		- Secure site and attempt to extinguish the fire with Ground Crew
	+ If unable to extinguish fire:
		- Call emergency services
		- Stop all fire suppression efforts and begin minimizing potential damage by clearing the area and removing other potential fire hazards
	+ DO NOT COMPROMISE YOUR SAFETY
* **Post-Incident**
	+ Document incident
	+ Contact PI and Designated Local Authority

# Pilot Incapacitation

* **Ensure the RPIC is IMMEDIATELY attended to**
	+ Typically, the VO will be the closest person to the RPIC
* **Communicate** the situation to the Flight Crew
* **Take Actions**
	+ VO to pause or stop flight operation, then resume attending to RPIC
	+ Ground Crew must be prepared to call emergency services
	+ Check transmitter/tablet status and control links
* **Issues**
	+ **Call emergency services if there is a possibility that they may be needed**
	+ If flight operation cannot be paused or stopped, initiate a manual termination, unless an alternative operator is available.
	+ RESPONSE PRIORITIES:
		- Avoid delaying emergency services to RPIC
		- Ensure UAS will not place additional persons at risk
		- Prevent the UAS from causing property damage
		- If able, land the UAS safely
* **Post-Incident**
	+ Document incident
	+ Contact PI and Designated Local Authority

# Airspace Encroachment

* **Maintain** visual contact with UAS
* **Communicate** the situation to the Flight Crew
* **Verify**
	+ Check state of UAS (Status/Flight Mode)
	+ Check location of UAS in flight area
* **Take Actions**
	+ **Ground Crew** – Alert flight area, prepare for landing
	+ **Visual Observer** – Monitor air traffic and provide
	+ **RPIC** – Evaluate best course of action
* **Issues**
	+ If a collision is imminent:
		- RPIC must take immediate evasive action
	+ If a collision is a strong possibility:
		- RPIC must land or terminate the flight at the nearest divert or safe location
	+ If the encroachment is unsafe but not likely to result in a collision:
		- RPIC must pause flight, reduce flight altitude and monitor the situation.
		- RPIC may only resume flight operation when the hazard has passed
	+ If the encroachment is noticeable, but not likely to cause a safety issue:
		- RPIC may continue flight operations
* **Post-Incident**
	+ Document incident
	+ Review See & Avoid procedures