AggieAir™ Safety Plan 2019

PURPOSE OF SAFETY PLAN:

This safety plan identifies potential safety risks associated with the safe deployment of the AggieAir Unmanned Aerial Systems (UAS) in the National Airspace System (NAS). Individual roles and responsibilities within the AggieAir flight crew will be identified during day-to-day flight operations and will be discussed during pre-mission briefings. This safety plan will be followed for all missions, and any additional safety risks will be identified/discussed for all out-of-state flight missions prior to departure.

RESPONSIBILITIES DURING FLIGHT MISSIONS:

1. Flight Coordinator.

   The flight coordinator is ultimately responsible for evaluating all specific types of risk, which may be site-specific and dependent on the flight mission objectives. Pre-mission briefings will take place prior to flights so that the Pilot-in-Command (PIC), Ground Control Station (GCS) operator, and other flight crew are fully aware of potential safety risks. The flight coordinator will delegate responsibilities during the mission briefing. For each flight mission, the flight coordinator is responsible to:

   - Brief all flight crew on the purpose of the flight and flight location.
   - Ensure all flight crew have reviewed the current Certificate of Authorization (C.O.A.) pertaining to the flight.
   - Establish that all essential notifications (discussed later) for safe flying have been posted to the relevant authorities.
   - Review the weather for the date and location of the flight.
   - Ensure that the flight crew are provided with correct high-visibility flight vests and radios, if required for the mission.
   - Ensure that all relevant flight test requests and flight test debriefing forms have been submitted.
   - Maintain and review all pre-flight check lists for UAS operations.
   - Document and have available emergency information for the hospital / medical center nearest to the flight location.

2. Pilot-In-Command (PIC).

   The PIC has final authority and responsibility for the operation and safety of AggieAir sUAS flights. The PIC is responsible to:

   - Ensure that the relevant Certificate of Waiver or Authorization (C.O.A.) for the flight mission has been obtained and is current with the Federal Aviation Administration (F.A.A.).
   - Submit a distance (D) Notice to Airmen (NOTAM) for any/all flights through the proponent’s local base operations or NOTAM issuing authority.
   - Obtain the relevant ATC clearance and contact information for relevant airport(s) for each flight mission.
Additional responsibilities of the PIC include the following:

- Maintain and hold the appropriate category, class, and type of rating for the conduct of the flight. Please refer to the PIC rating in the relevant C.O.A.
- Review the current C.O.A.
- Ensure that the UAS is airworthy to conduct flight operations as stipulated by the C.O.A.
- Ensure and maintain direct two-way communication on the proper UNICOM or CTAF (common traffic advisory) channels for the flight area.
- Have the ability at all times throughout the flight to maneuver the unmanned aircraft in response to radio communications with manned aircraft in the area.
- In the event that a flight will take place within tower controlled airspace, work with the ATC (Air Traffic Control) authority for the flight area to create a plan including communications and flight areas for the operation.
- Ensure that visual observers (where applicable) are able to see the UAS throughout the entire flight and can clearly communicate with the PIC during the flight.
- Ensure that a full pre-flight briefing has taken place with the flight coordinator and flight crew discussing the flight plan. Pre-flight briefings will include the following:
  - Contents of the C.O.A.
  - Flight altitudes
  - Mission overview, including handoff procedures
  - Contingency procedures for lost radio link, divert, and flight termination

3. Flight Crew and Field Data Collection Crew.

All flight crew and field data crew are responsible for the following:

- Review C.O.A. and field data collection maps prior to all flight missions.
- Ensure that the flight plan has been reviewed and discussed with both flight coordinator, PIC, and all other flight crew.
- Ensure that hand held radios work correctly and are fully charged and that the correct channel has been identified/discussed with the PIC for two-way communication during flight.
- Wear the appropriate clothing (layered if necessary) and footwear for the environment/weather and duration of mission.
- Wear appropriate safety vests for all flight missions.
- Pack the necessary food and fluids for the flight mission.

FLIGHT SAFETY:

Flight incident/accident/mishap reporting.

Air Traffic Control (ATC) must be immediately notified in the event of any emergency, loss and subsequent restoration of command link, or loss of PIC or observer visual contact that may impact the safety or operations of the UAS flight. The use of cells phones by any of the flight crew is restricted to communications pertinent to the operational control of the unmanned aircraft and any required communications with ATC. The PIC is responsible for the safe operating distance between aviation activities and unmanned aircraft at all times.
DRIVING SAFETY:

USU vehicles.

All flight/field crew should maintain and keep up-to-date their university driving credentials where applicable. The flight coordinator and PIC should both be up-to-date with the towing/trailer training available on campus. During long journeys to out-of-state flight locations (e.g., California), driving should be divided between all field crew, but only when the individual feels confident/eligible to drive the truck and trailer. Regular breaks should be maintained on all lengthy journeys. All driving violations and accidents should be reported to the appropriate authorities and UWRL immediately.

AggieAir Service Center trailer.

Prior to any flight mission involving the truck and trailer, either the flight coordinator or the PIC should inspect the truck/trailer to ensure that both are road worthy. The trailer should be inspected at the beginning of each year/field season and general maintenance should be carried out specifically on the trailer. The maintenance should include a detailed inspection of the trailer generator, tires, and bearings, and these should be replaced if necessary. Only personnel that have completed the trailer driving training and/or are competent in towing a trailer, should be driving the vehicle.

GENERAL FIELD SAFETY:

Safety awareness in the field during flight operations.

Prior to any flight mission, the flight coordinator should identify the nearest hospital/medical center along with corresponding telephone numbers to be used in case of any emergency. All field crew should be alert to potential safety issues whilst on any flight mission, especially in remote regions. These safety issues may vary widely and could potentially involve some of the following:

- Possible snake/insect attacks/bites.
- The remote possibility of being swept away by a river, drowning.
- Sun stroke, heat exhaustion.
- Potential of a fall and resulting injury.

As a precaution, the field crew and/or data collection team should:

- Keep cell-phones fully charged and with them in the field wherever possible; if cell reception is not available at the location, the crew should be provided with a radio to contact the flight coordinator.
- Wear appropriate layered clothing. No open-toed shoes; boots are preferable. Wear sun hats and sun glasses during summer periods.
- Whenever possible, stay protected from the sun; take necessary breaks.
- Bring fresh, nonperishable foods; seek advice from flight coordinator.
- Always pay attention to the surroundings, especially in the natural environment. Steep terrain, wild animals, burrows/holes are all potential hazards to look out for.
Fieldwork safety during summer and winter months.

Safety precautions will vary depending on the physical environment and also on weather conditions.

Summer Months-

- **Sun Protection.** Sunlight contains UV radiation, which can cause cataracts and skin cancer. Be sure to cover up, bring sunscreen, and wear a wide brimmed hat and UV absorbent sunglasses.
- **Heat.** Bring plenty of water and drink plenty beforehand. Generally, for a half day trip with activity in the sun, bring 2 - 3 L or 1L with a filter system. Wear light loose clothing. Take frequent short brakes in the shade. Eat smaller meals.
  - Use the buddy system and learn the signs of heat-related illness – clammy, profuse sweating, dizziness. Place an overheated worker in the shade or a cool room. Loosen clothing and apply a cool wet cloth to face and neck. Vomiting suggests medical attention is needed.
- **Hiking:** Wear appropriate footwear for the terrain and loose synthetic clothing – no cotton.
- **Rain.** Always prepare for changing weather conditions, especially if working in mountain environments. Bring a rain jacket with hood, rain pants, and waterproof boots. If potentially hiking in snow or swampy areas, bring gators. When ground is wet, move slowly and safely as ground may become slippery.
- **Food.** Bring food, protein bars, nuts, dried fruit, etc., and eat smaller meals.

Winter Months-

Most of Aggie Air’s UAV flight testing and development of new platforms and payloads typically occurs during the fall and winter months, when service center contract flights have ended. All flight testing will take place at either our test facility at Cache Junction or our new facility in Wellsville.

- **Sun protection:** Snow reflects sunlight at all different angels, so ensure you have adequate sunscreen and put in places you wouldn’t think (e.g., the bridge between your nostrils). Oil based sunscreen are good in the winter because water-based sunscreens can freeze and irritate your skin
- **Clothing:** You should have waterproof pants, boots, gaiters where appropriate, a hat, and sunglasses.
  - **Layers:** Bring multiple layers of clothing including a synthetic, silk, or wool base layer, a mid-layer, and a waterproof shell with pit-zips. Maintaining body temperatures that are not too low or too high is critical. If you are too warm you will sweat, and your clothing will get wet and your will be cold and uncomfortable.
- **Food and Water:** Bring plenty of dried food for a day and plenty of water and/or a water filter.

Fieldwork safety regarding wildlife.

UAV flights typically operate in semi-remote regions. Consequently, a variety of wildlife maybe be encountered, including bears, elk, moose, deer, mountain goats, and cows / bulls. On rare occasions field crew may encounter mountain lions, bobcats, coyotes, fox, porcupines, raccoons, beaver, or badgers. Normal caution should be taken with any and all animals encountered in the field. Leave them be; they’re most likely trying to avoid you anyway.
Reptiles and insect are the more likely wildlife to be encountered by the UAV flight/field crew\(^1\). Serious risk is unlikely but possible and is posed largely by venomous snakes and insects. Several rattlesnake species, venomous spiders (black widow spiders, hobo spiders, desert recluse spider (according to some), and perhaps others) may be encountered while in the field. Caution should be taken to avoid these animals should they fail to avoid you. Be aware of your surroundings and what is on the ground or in areas into which you may be reaching or crawling. Should you be bitten by something dangerous, you may not know immediately. Know which symptoms may indicate a snake or spider bite.

**Snake Bites—**

*Symptoms:* Snake bite symptoms may include but are not limited to the following (2):

- Two puncture wounds
- Swelling and redness around the wounds
- Pain at the bite site
- Difficulty breathing
- Vomiting and nausea
- Blurred vision
- Sweating and salivating
- Numbness in the face and limbs

*First Aid:* Workers should take the following steps if they are bitten by a snake (2):

- If you or someone you know are bitten, try to see and remember the color and shape of the snake, which can help with treatment of the snake bite.
- Keep the bitten person still and calm. This can slow down the spread of venom if the snake is venomous.
- Seek medical attention as soon as possible.
- Dial 911 or call local Emergency Medical Services (EMS).
- Apply first aid if you cannot get the person to the hospital right away.
- Lay or sit the person down with the bite below the level of the heart.
- Tell him/her to stay calm and still.
- Wash the wound with warm soapy water immediately.
- Cover the bite with a clean, dry dressing.

*What NOT TO DO* if you or someone else is bitten by a snake (2):

- Do not pick up the snake or try to trap it (this may put you or someone else at risk for a bite).
- Do not apply a tourniquet.
- Do not slash the wound with a knife.
- Do not suck out the venom.
- Do not apply ice or immerse the wound in water.
- Do not drink alcohol as a pain killer.
- Do not drink caffeinated beverages.
Spider Bites-

**Symptoms:** Spider bite symptoms may include but are not limited to the following (3):

Typically, a spider bite looks like any other bug bite—a red, inflamed, sometimes itchy or painful bump on your skin—and may even go unnoticed. Harmless spider bites usually don't produce any other symptoms. However, symptoms associated with spider bites can range from minor to severe. Although extremely rare, the most severe cases can result in death. Possible symptoms resulting from a spider bite include the following:

- Itching or rash
- Pain radiating from the site of the bite
- Muscle pain or cramping
- Reddish to purplish color or blister
- Increased sweating
- Difficulty breathing
- Headache
- Nausea and vomiting
- Fever
- Chills
- Anxiety or restlessness
- High blood pressure

**First Aid:** Workers should take the following steps if they are bitten by a spider (3):

- Stay calm. Identify the type of spider if it is possible to do so safely. Identification will aid in medical treatment.
- Wash the bite area with soap and water.
- Apply a cloth dampened with cold water or filled with ice to the bite area to reduce swelling.
- Elevate bite area if possible.
- Do not attempt to remove venom.
- Notify your supervisor.
- Immediately seek professional medical attention.

**SOURCES:**

2. [https://www.cdc.gov/disasters/snakebite.html](https://www.cdc.gov/disasters/snakebite.html)
3. [https://www.cdc.gov/niosh/topics/spiders/symptoms.html](https://www.cdc.gov/niosh/topics/spiders/symptoms.html)
Bee, wasp or hornet stings-
https://www.mayoclinic.org/diseases-conditions/bee-stings/diagnosis-treatment/drc-20353874

General considerations:
Be generally aware of your surroundings. Scan working and travelling areas, including above you and below platforms, looking for nests or hives. Do not disturb a nest or hive. If bees or wasps are present, walk calmly away and do not swat them. Do not step on bees/wasps as they can sometimes sting after death and the odor may attract more bees/wasps. Avoid bright clothing and strong smells (such as food).

Allergic Reaction:
Personnel who have a known allergy to bee stings must inform their supervisor before going to the field. This person must carry an Epi-pen. The location of the pen and its use should be known to that person’s supervisor and their field buddy. After using an Epi-pen seek emergency medical assistance immediately (911 or emergency room).

Anaphylaxis symptoms usually occur within minutes of exposure to an allergen and can be fatal. Sometimes, however, it can occur a half-hour or longer after exposure. Signs and symptoms include:

- Skin reactions, including hives and itching and flushed or pale skin
- Low blood pressure (hypotension)
- Constriction of your airways and a swollen tongue or throat, which can cause wheezing and trouble breathing
- A weak and rapid pulse
- Nausea, vomiting or diarrhea
- Dizziness or fainting

If any of these symptoms occur seek medical treatment immediately.

Ordinary Bee Sting:
For an ordinary bee sting that does not cause an allergic reaction, “home treatment” is enough. Multiple stings or an allergic reaction are a medical emergency that requires immediate treatment.

Home treatments:
If you can remove the stinger do so as soon as possible. Scrape the stinger out using a credit card, blunt knife, or fingernail. Do not try to remove a stinger below the skin surface. A stinger may not be present, only bees leave their stingers. Other stinging insects, such as wasps, do not.

- Wash the affected area with soap and water
- Apply a cold compress
- Take over the counter pain relievers as needed.
• If the sting is on an arm or leg, elevate it.
• Apply hydrocortisone cream or calamine lotion to ease redness, itching or swelling.
• If itching or swelling is bothersome, take an oral antihistamine that contains diphenhydramine (Benadryl) or chlorpheniramine.
• Avoid scratching the sting area. This will worsen itching and swelling and increase your risk of infection.
SIGNATURE SHEET:

By signing this sheet, you have read and understood all details relating to UAV flights in association with AggieAir™, and will abide by all regulations stated in this safety plan.

Name: 

Date: 