

APPENDIX A
AERIAL SURVEY REQUIREMENTS AND PROVISIONS

**Geo-Marine Inc.
Minimum Aircraft and Crew Provisions
for Aerial Surveys**

The following applies to aviation services contracted (vendor) by Geo-Marine, Inc (GMI) that includes aircraft and pilot services chartered, contracted or rented. The list includes minimum requirements for all survey flights. Additional requirements may be included that apply to offshore surveys defined as aircraft operations conducted over water and beyond glide distance from shore.

Certification

Preferred certification for planned or routine aerial surveys is as follows:

The vendor shall hold a current Federal Aviation Administration (FAA) Air Carrier or Operating Certificate. Operations Specifications shall authorize operation of the category and class of aircraft and conditions for flights required to complete missions as specified by GMI.

Aircraft and operators must complete a comprehensive safety audit to demonstrate that their operation, aircraft, and pilots meet at least certification requirements under 14 CFR Part 119 and GMI requirements contained in this document. Minimum requirements for offshore flights are listed below:

Offshore Flights

Aircraft and Aircraft Operators must meet any one of the following certification criteria in order of preference:

1. Aircraft will be operated and maintained under provisions of 14 CFR Part 135. Specific aircraft used shall be carried on the list required by 14 CFR 135.63.

or

2. Approval/certification of the vendor/operator by a federal agency, such as NASA, Department of Energy Operations or National Business Center Aviation Management Directorate (NBC-AMD). Aircraft operators which are not part 135 certificate holders but have been approved by a federal agency such as those listed above shall be conducted in accordance with the operation requirements of their approvals and limitations of the aircraft airworthiness certificate.

or

3. The operator can complete a comprehensive safety audit to demonstrate that their operation, aircraft and pilots, meet or exceed Part 135 standards as well as the GMI requirements contained in this document. These audit services are available from private sector aviation consulting firms and the cost of the audit is the burden of the applicant. Operators shall provide a copy of the safety audit to GMI and this audit will be subject to review and approval by GMI.

Flight Plans

Pilots shall file and operate on a FAA flight plan. Vendor flight plans are not acceptable. Flight plans shall be filed prior to takeoff when possible.

Flight Following

One of the flight following methods shall be implemented:

1. Pilots are responsible for flight following with the FAA, USCG, or other responsible governmental entity. Check-in shall not exceed one-hour intervals under normal circumstances.

or

2. The vendor shall provide, install, and maintain an automated flight following (AFF) system per the manufacturer's requirements. The AFF system installed must be one compatible with the Government's AFF network (<https://www.aff.gov/>). The vendor must procure and maintain a subscription for satellite service that allows interface with the Government's AFF network during any use under this contract. The aircraft vendor must register this installation with AFF. (Registration Information will be provided at award) The standard position-reporting interval shall not exceed two minutes. Aircraft location checks shall not exceed one-hour intervals under normal circumstances. It is incumbent upon the aviation vendor to conduct a thorough evaluation of any potential AFF vendor's services and products to ensure compliance with this requirement.

Manifesting

The pilot-in-command shall ensure that a manifest of all crewmembers and passengers on board has been completed. A copy of this manifest shall remain at the point of initial departure. Manifest changes will be left at subsequent points of departure when practical.

Checklist

Pilot(s) shall utilize a written checklist prior to any departure. Failure to use written checklists required for departures may result in cancellation of any contracts or agreements between the vendor and GMI.

Pilot(s) will make regular use of written checklists for all other necessary flight operations.

The vendor will develop and utilize a secondary written checklist to include applicable requirements of this document.

Passenger Briefing

Before each takeoff, the pilot-in-command shall ensure that all passengers have been briefed in accordance with the briefing items contained in 14 CFR 135 and additionally:

1. Emergency Locator Transmitter (ELT) and Emergency Position Indicating Radio Beacon (EPIRB)
2. First Aid Kit
3. Personal Protective Equipment (if applicable)

Flight Operations

Notwithstanding any status as a Public Aircraft Operation, the vendor shall operate in accordance with his approved FAA Operations Specifications, and all portions of 14 CFR Part 91 and each certification listed above.

1. Flight operations shall not extend beyond 45 minutes reserve fuel at 100 knots at sea level - required
2. High wing loads and excessive banking will not be allowed. A high margin of safety between conditions, loading, airspeed and angle of bank will be maintained.
3. Minimum altitude for the type of flying, requirements of surveys and terrain will be determined before operations and maintained.
4. The pilot in command will ascertain aviation minimums are sufficient for a flight to proceed. GMI survey lead observer will have final authority to determine whether a flight may proceed.

Pilot Authority and Responsibilities

The pilot is responsible for the safety of the aircraft, its occupants, and cargo. The pilot shall comply with the directions of the Government, except, when in the pilot's judgment compliance will be a violation of applicable federal or state regulations or agreement provisions. The pilot shall refuse any flight or landing which is considered hazardous or unsafe. The pilot shall not permit any passenger to ride in the aircraft or any cargo be loaded unless authorized by GMI. Pilots are responsible for computing the weight and balance for all flights and for assuring that the gross weight and center of gravity do not exceed the aircraft's limitations. Pilots shall be responsible for the proper loading and securing of all internal or external cargo.

Flight Crew Requirements

Pilots shall have at least a FAA commercial pilot certificate with appropriate category, class, and type rating if required.

Instrument rating for airplanes

Pilots shall hold at least a current second class medical certificate issued under provisions of 14 CFR Part 67.

Pilots shall show evidence of satisfactorily passing all required FAA flight checks in accordance with provisions of 14 CFR Part 135. All pilots shall meet the currency requirements of 14 CFR 61.57.

Pilot flying hours shall be verified from certified pilot records.

Pilot-In-Command shall have recorded minimum flying time as pilot-in-command as follows:

- a. 1000 hours total pilot time
- b. 100 hours in category within the preceding 12 months
- c. 750 hours PIC in airplanes
- d. 25 hours make and model
- e. 20 hours operating below 1000 feet supporting observational, photogrammetric, or other natural resources surveys (over open ocean preferred)

Pilots shall have completion of a dedicated course on unusual attitude and spin recovery training.

Offshore Flights

Two pilots are required for each offshore flight.

Pilot in command shall have recorded minimum flying time as pilot-in-command as follows:

- a. 1500 hours total pilot time
- b. 100 hours in category within the preceding 12 months
- c. 1200 hours PIC in airplanes
- d. 25 hours make and model
- e. 200 hours multiengine
- f. 100 hours operating below 1000 feet supporting observational, photogrammetric, or other natural resources surveys (over open ocean preferred)

Pilot Second in Command (Copilot)

- a. Requirements as specified in 14 CFR Part 135.

Flight crewmembers must demonstrate that they have taken a ditching and water survival training course within the preceding 5 years.

Flight Crewmember's Duty and Flight Limitations

Duty Limitations. Duty includes flight time, ground duty of any kind, and standby or alert status. Local travel up to a maximum of 30 minutes each way between the work site and place of lodging will not be considered duty time. Flight crewmembers will be subject to the following duty hour limitations:

- a. A maximum of 14 consecutive duty hours during any assigned duty period
- b. Pilots shall be given 1 day of rest within any 7 consecutive calendar days, or two days of rest within any 14 consecutive days.
- c. Pilots shall be given a minimum of 10 consecutive hours of rest (off duty), not to include any preflight or post-flight activity, prior to any assigned duty period.

Flight Limitations. All flight time, regardless of how or where performed, except personal pleasure flying, will be reported by each flight crew member and used to administer flight time and duty time limitations. Flight time to and from a duty station as flight crew member (commuting) will be reported and counted toward limitations if it is flown on a duty day. Flight time includes, but is not limited to: military flight time; charter; flight instruction; 14 CFR 61.56 flight review; flight examinations by FAA designees; and flight

time for which a flight crew member is compensated; or any other flight time of a commercial nature whether compensated or not. Pilot time computation shall begin at takeoff and end when the aircraft is stopped at the parking spot. Flight crewmembers will be limited to the following flight hour limitations, which shall fall within their duty hour limitations:

- a. 10 hours for a flight crew consisting of two pilots during any assigned duty period.
- b. A maximum of 50 hours flight time during any consecutive six-day period. When a pilot acquires 50 or more flight hours in a consecutive six-day period, the pilot shall be given the following 24-hour period of rest (off duty) and a new six-day cycle shall begin. The 24-hour period shall be one calendar day off duty.

Pilot Proficiency

Pilots shall display evidence of experience in using all equipment specified (marine and aviation VHF radio, GPS, etc.). Pilots may be required to demonstrate proficiency.

Pilots shall demonstrate their ability to perform the following functions with the required GPS:

1. Determine the geographic coordinates of a destination identified on a sectional aeronautical chart
2. Install destination coordinates
3. Acquire distance/bearing information to a destination
4. Record as a waypoint, coordinates of various locations while enroute to a primary destination
5. Navigate from a present position to a selected recorded waypoint or between two recorded waypoints.

The aircraft vendors shall submit an experience resume for each pilot offered for approval. The resume shall include names and pilot addresses of past employers, substantiation of related type and typical terrain flying and must show any and all accidents involving aircraft.

Pilots shall be knowledgeable of IFR, VFR, low level and slow flight procedures while flying over water. This includes special flight techniques for low level in slow flight configuration. Pilots may be required to demonstrate proficiency during an initial evaluation flight.

Personal Protective Equipment

Personal Flotation Devices (PFD) required by 14 CFR 91 or Life-Preserver(s) (TSO-C13) required by 14 CFR 135 shall be on board all aircraft operated over water and beyond power-off gliding distance to shore.

Anti-exposure suits shall be readily available to occupants of multiengine aircraft when conducting extended over water flight (as defined in 14 CFR 1.1) and when the water temperature is estimated to be 59 degrees Fahrenheit or less.

Aircraft Requirements

These standards are in addition to airworthiness requirements.

Condition of Equipment

Vendor-furnished aircraft and equipment shall be operable, free of damage, and in good repair. All primary and secondary gauges, avionics, and systems shall be operational.

Aircraft systems and components shall be free of leaks except within limitations specified by the manufacturer.

All windows and windshields must be clean and free of scratches, cracks, crazing, distortion, or repairs, which hinder visibility. Repairs such as safety wire lacing and stop drilling of cracks are not acceptable

permanent repairs. Prior to acceptance, all temporarily repaired windows and windshields shall have permanent repairs completed or shall be replaced.

The aircraft interior shall be clean and neat. There shall be no un-repaired tears, rips, cracks, or other damage to the interior. The exterior finish, including the paint, shall be clean, neat, and in good condition. Any corrosion shall be within manufacturer or FAA acceptable limits.

Additional Equipment Requirements

Fire extinguisher(s), as required by 14 CFR 135, shall be a hand-held bottle with a minimum 2-B:C rating mounted and accessible to the flight crew.

Shoulder harness and lap belt for front seat occupants and both occupants in tandem seat airplanes are required. The shoulder strap and lap belt will fasten with a metal to metal, single-point, quick-release mechanism.

One automatic-portable/automatic-satellite GPS fixed ELT, utilizing an external antenna and meeting the requirements of 14 CFR 91.207 (excluding section f.), shall be installed per the manufacturer's installation manual, in a conspicuous or marked location.

Minimum Aircraft Specifications

1. At least 830 lb. or 2 passenger capacity –required.
2. High wing-required
3. Safe operation of survey speed of 80kts-100kts.
4. Two positions for biologists with unobscured window views on each side of the aircraft -required.
5. A minimum of 4.5 hours operational flight range –desired
6. Following avionics, at minimum:
 - a. GPS navigation aids -required
 - b. Radios:
 - i. fully operational primary and secondary COMM (VHF radio) units (VHF stand alone linked to the intercom, NAV/COMM, GPS/COMM)
 - c. External antenna mount for scientist's GPS -desired.
 - d. Intercom (static free, clear communications) with headsets for all occupants of aircraft – required; linkage to marine radio -preferred
7. One opening window accessible to the scientific party for photography and/or a floor camera port -required.
8. AC or DC power for powering lap top computers –required.
9. IFR-certified -required
10. Registered 406 MHz EPIRB capable of being removed from aircraft and operated in a marine environment -required.

Offshore Requirements

1. At least 1200 lb. or 2 passenger capacity –required, 3 passenger capacity -desired
2. High wing-required
3. Multi-engine -required, turbine desired
4. Capable of survey speed of 100 Knots.
5. Two positions for biologists with unobscured window views on each side of the aircraft -required.
6. A minimum of 6 hours operational flight range –desired
7. Flight operations shall not extend beyond 45 minutes reserve fuel at 120 knots at sea level - required
8. Following avionics, at minimum:
 - a. GPS navigation aids -required
 - b. Radios:

- i. fully operational primary and secondary COMM (VHF radio) units (VHF stand alone linked to the intercom, NAV/COMM, GPS/COMM)
 - ii. aircraft mounted marine radio –desired;
 - c. External antenna mount for scientist's GPS -desired.
 - d. Intercom (static free, clear communications) with headsets for all occupants of aircraft – required; linkage to marine radio -preferred
9. One opening window aft of the cockpit and accessible to the scientific party for photography and/or a floor camera port -required.
10. AC or DC power for powering laptop computers -desired
11. IFR-certified -required
12. Extended overwater operations emergency equipment as listed in 14 CFR Part 135 §135.167, including registered 406 MHz EPIRB capable of being removed from aircraft, floating and operated in a marine environment -required.

Maintenance Requirements

Aircraft shall be maintained in accordance with all applicable Mandatory Manufacturer's Bulletins as required by the vendor's operations specifications, and all applicable FAA Airworthiness Directives (AD).

Maintenance Test Flight. A functional maintenance test flight shall be performed, at the vendor's expense, following installation, overhaul, major repair, or replacement of any engine, propeller, or primary flight control. The pilot shall enter the result of this test flight in the aircraft maintenance record.

Fuel and Servicing Requirements

All fuel must be commercial (or military) grade aviation fuel approved for use by the airframe and engine manufacturer.

Passengers shall not be involved with any refueling of aircraft.

Aircraft shall not be refueled while engines are running and propellers are turning.

Aircraft Vendor Insurance

Insurance in amounts equal to or greater than the minimum amounts required by either 14 CFR 205.5, the state in which the vendor is operating, or single liability limit of \$100,000 and each occurrence of \$1,000,000, whichever is greater.

Observer Crew

Observers shall have successfully completed an aviation safety training as prescribed in the Exhibit to NOAA Administrative Order (NAO) 209-124 (NOAA Aviation Safety Training and ALSE Requirements). For information on training and training requirements see <http://www.oma.noaa.gov/aviationsafety/safety.html>.

Observers shall have immediately accessible in the aircraft, applicable Aviation Life Support Equipment (ALSE) prescribed in the Exhibit to NAO 209-124 and the following:

1. Nomex Flight Suit
2. Strobe light
3. Rescue Streamer or Sea Dye Marker
4. Combo-edge Knife

Observers should wear the following personal safety equipment/gear during flight:

1. Leather boot or closed toe shoes