

HSAC Preferred Maintenance Guidelines for Aerial Observations Airplanes (RP) # 2006-01

Background:

Proper aircraft maintenance is essential for safe operations and the HSAC Aerial Observation Committee (AOC) recommends the following maintenance guidelines.

Recommended Practices:

1. Maintenance of Pipeline Aircraft

This section provides maintenance guidance for company owned or contracted aircraft. Its goal is to provide for the repair, maintenance, overhaul and modification of company owned or contracted aircraft and associated components in accordance with the objectives of maintaining safety; meeting airworthiness standards; and achieving maximum schedule reliability. Included in this guide are policies and procedures to be followed to ensure that the aerial patrol aircraft are maintained in accordance with criteria meeting or exceeding the requirements of appropriate regulatory authorities, manufacturer and company standards.

It is the responsibility of the pilot-in-command to ensure that the aircraft Certificate of Airworthiness is in force before commencing a flight. This can be determined by inspecting the discrepancy logbooks. The Certificate of Airworthiness of an aircraft is not in force unless the equipment, systems, and instruments prescribed in the applicable airworthiness standard and all required equipment is functioning correctly and meet the requirements of the original Type Certificate.

2. Responsibilities of the pilot / operator

The Pilot / Operator is responsible for the planning and control of all maintenance, liaison with the civil aviation authority on maintenance topics, and liaison with all Persons or Approved Maintenance Organizations (AMOs) performing maintenance on the operator's aircraft. They shall have access to all applicable technical and regulatory publications necessary to perform these duties, and shall ensure that those publications are kept up to date. The Pilot / Operator shall remove from service any aircraft that are unsafe, or that do not comply with the regulatory requirements of the Federal Aviation Administration or this Manual. In cases of absence, the duties of the Pilot / Operator may be assigned in writing to another qualified person. The decision to comply with an optional aircraft service change will be a business decision made on the basis of whether it will add to safe operation or provide operational benefits to the department.

3. Technical Records

Immediately upon finding a defect in an aircraft, or upon completing any maintenance on an aircraft, the person discovering the defect or performing the maintenance shall enter details

of the event in the Discrepancy logbook. These logs are contained in a book kept on board the aircraft. The aircraft log shall be consecutively numbered and labeled with the registration number of the individual aircraft. The maintenance records should be duplicated and one copy shall be placed in a safe storage location not on board the aircraft. One copy of the entry will be kept on board the aircraft and one will be retained by the operator after the deficiency is corrected and the aircraft returned to service. The retained copy will be included in the permanent records for the aircraft and placed in a safe storage location. If an event occurs between scheduled maintenance checks, the entries shall be made in the discrepancy logbook. Details of defects found during a scheduled maintenance check, or of maintenance performed during such a check, may be entered directly in the applicable airframe, engine, or component record, provided that any outstanding items remaining upon completion of the maintenance check are entered in the discrepancy logbook upon certification of the maintenance event /check or prior to flight. All required or scheduled inspections will be signed off in the applicable Airframe or Engine Logbook. These sheets will become part of the permanent aircraft records. The following processes will be used to perform maintenance and return the aircraft to service:

a. For scheduled Maintenance:

1. Consult the Airframe or Engine logbooks for required maintenance.
2. Print and use the applicable inspection procedure from the manufacturer's maintenance manual.
3. Perform research to determine any applicable Airworthiness Directives (AD) or Manufacturer's Bulletins that may be due now or before the next inspection period.
4. Perform the inspection and return the aircraft to service in accordance with FAR's
5. The technician will sign off the inspection using the applicable Airframe or Engine Logbook and provide a separate copy of the signoff for the inclusion in the permanent aircraft records.
6. The completed Airworthiness Directive and Bulletin listing will be included in the Airframe or Engine Logbook.

b. For Non-Scheduled Maintenance:

1. Review the discrepancy logbook for write-ups from the pilot, preflight discrepancies, AD's Bulletins, or Inspection discrepancies.
2. The work will be completed by an appropriately rated technician.
3. The discrepancy will be cleared and the aircraft returned to service by a sign off in the discrepancy Log and a separate copy of the signoff for the inclusion in the permanent aircraft records.
4. If unable to clear the discrepancy, the discrepancy will be deferred using the MEL or the aircraft grounded.
5. If a component is changed, it will be signed off on the discrepancy log and the parts approval forms will be attached to the Aircraft Logbook.

All maintenance performed on flight controls, engine components and controls, landing gear, and any maintenance requiring specific rigging procedures or torque values, and any maintenance activity which will be hidden from view upon completion shall be inspected during and/or following completion of the maintenance activity prior to returning the aircraft to service.

All major maintenance not specifically covered above shall also be inspected in a like manner. Minor maintenance, which does not affect the airworthiness of the aircraft, routine servicing which does not require disassembly and visual inspections also, need not be included in this procedure. Any A&P Certificated technicians or persons who are familiar with the maintenance practices of the aircraft on which the maintenance is being performed may act as inspectors.

4. Maintenance Schedules

All aircraft shall be maintained in accordance with the manufacturers approved maintenance schedule. Copies of the maintenance schedule are included in the Aircraft Maintenance Manual. This maintenance will include Annual, 100 Hour and CAP (Continued Airworthiness Program) recommended inspections, where available. All mandatory and recommended Bulletins will be completed within the time limit stated in the bulletin. Optional bulletins are at the discretion of the company. Adhere to manufacturer's TBO recommendations, transponder and altitude reporting checks will be performed every two years in accordance with FAR Part 91. Engine oil changes will be completed In Accordance with manufacturer's recommendations and the use of an oil analysis program is recommended.

5. Aircraft Special Inspections

During operations, an aircraft may be subject to speeds or other conditions that exceed normal operating limitations: severe turbulence, exceeding airspeed limitations, abnormal maneuvers, hard landing, over weight landing, or lightning strike. The engines may be subject to foreign object damage or over speed conditions. If any of these conditions occur, the aircraft will be restricted from normal flight until a special inspection, as recommended by the manufacturer, is carried out by a licensed technician.

6. Magnetic Direction Indicators

The compensated installation may not have a deviation, in flight, greater than 10 degrees on any heading. A placard meeting the above requirements must be installed on or near the magnetic direction indicator. The placard must state whether calibration was made with radio/air conditioner on or off. Each calibration reading must fall within 45-degree increments. Verification of the magnetic direction indicator is to take place every 24 calendar months or sooner if mandated by the appropriate regulatory authority.

7. Return to Service Flights

A test flight will be conducted after maintenance has been performed that could affect flight characteristics. A qualified flight crew will conduct test flights. Maintenance observations

will be done by a licensed Technician, and will be conducted in accordance with applicable sections of the test flight procedure specified for that particular aircraft type. Upon completion of the test, flight the flight crew and maintenance representative will discuss the results and sign off the completed test flight report.

a. Conditions Requiring a Return to Service Flight – Fixed Wing

1. Engine change (single).
2. When one (1) propeller is changed.
3. When a propeller has failed to govern in flight and it cannot be fully checked on the ground, or if the trouble cannot be definitely established.
4. When extreme roughness is reported on an engine and no definite cause can be found.
5. Wing major repairs – See Note 1.
6. Fuselage major repairs – See Note 1.
7. Horizontal and vertical stabilizer – Major repair – See Note 1.
8. Aileron, rudder, or elevator change. - See Note 3 & 4.
9. Airplane buffeting, vibration or flutter reported - See Note 2.
10. Flight control surface major repair – See Note 1.
11. As mandated by appropriate regulatory authority requirements.

NOTE 1: A test flight is required when major repairs have been made and/or structural members have been replaced, and there is reason to believe the flight characteristics of the airplane may have changed.

NOTE 2: When airplane buffeting, vibration or flutter is reported that cannot be readily accounted for on the ground.

NOTE 3: One or more main control cable changes do not require a test flight, provided that a rigging inspection is properly conducted and that control surface travel is within the limits specified in the applicable maintenance manual.

NOTE 4: Any trim tab changes do not require a test flight, provided that a rigging inspection is conducted and that the control surface travel is within limits.

8. Elementary Work & Servicing

No person shall perform any elementary work or servicing (Oil Changes, Light Bulb replacement, etc.) without first being trained and authorized by an appropriately rated Airframe and Powerplant Technician trained in the task to be accomplished. This training will be documented and included in the person's company training file. Elementary work and servicing shall be performed in accordance with the methods and procedures recommended by the aircraft or engine manufacturer and all work will be recorded in accordance with Paragraph 1.2.

9. Airworthiness Directives / service bulletins

The person returning the aircraft to service after any scheduled inspection shall review all new and revised airworthiness directives upon receipt, to determine if they are applicable.

They shall enter details of all applicable airworthiness directives, and details of all directives pertaining to the aircraft make and model, in the appropriate airframe, engine, or component technical record. The person returning the aircraft to service shall determine the date, air time or operating cycles, when the actions specified in the directive must be taken. If the required actions are due before the next scheduled maintenance, activity they shall make the necessary entries in the log in accordance with section 1.8.

10. Evaluation Program

The Pilot/Operator shall continually evaluate the effectiveness of the maintenance control system, operating procedures and maintenance schedules. At intervals not greater than twelve months, a review of the aircraft technical records must be conducted, to ensure that the system, procedures and schedules are satisfactory and that all personnel doing maintenance on the operator's aircraft are properly trained on the equipment and processes. This review shall also include an assessment of all defects reported during the period, to identify any negative trends in aircraft performance or reliability. Where deficiencies are discovered, the Pilot / Operator shall take action to correct them. Where the deficiencies relate to the performance of maintenance, details of the deficiencies shall be communicated to the applicable maintenance providers. Upon completion of the review, the aircraft maintenance records will be transferred to the file maintained for the storage of the permanent aircraft records. The aircraft and engine logbooks will be reviewed before flight to determine that there are no outstanding maintenance items or inspections due.

Upon receipt of all recommendations issued by the aircraft, engine, and component manufacturers in the form of service bulletins or equivalent documents, the Operator shall review the recommendations to determine whether compliance is appropriate. An entry will be made in the airframe or engine logbook by an appropriately rated person showing compliance with all required bulletins and all records required by this section shall be retained as part of the permanent aircraft records.

11. Deferred Rectification of Defects

All defects shall be cleared before further flight of the aircraft, except as provided in this section. Where permitted by F.A.A. regulatory provisions as applicable, aircraft having outstanding defects may be operated subject to the following procedures:

- a. Where a Minimum Equipment List (MEL) has been approved and the list includes limits on the amount of time equipment may be inoperative, those limits apply.
- b. Where the MEL does not specify time limits, the aircraft may be operated following discovery of a defect. This provision is conditional to the following procedure:
 1. The pilot reports and coordinates the defect deferral with the Director of Maintenance or equivalent, who will coordinate the authorization of the deferral;

2. the defect shall be recorded in the aircraft discrepancy log ;
3. The discrepancy log entry shall specify the reason for the deferral and the latest date by which the defect must be corrected.

12. Technical Dispatch

Technical dispatch of aircraft shall be by means of a review of the discrepancy logbook. The Pilot/Operator shall ensure that all items of deferred maintenance other than those recorded in the current page of the discrepancy logbook are entered on an approved list attached to the front page of the logbook. Immediately following completion of any item of scheduled maintenance specified by a maintenance schedule, airworthiness directive or other mandatory requirement, the person returning the aircraft to service shall review the aircraft technical records to determine the date, air time, or operating cycles when the next scheduled maintenance activity will become due, and make an entry to that effect in the discrepancy logbook. Before each flight of an aircraft, the PIC shall consult the discrepancy logbooks and take note of the next scheduled maintenance requirement and the current list of outstanding defects to decide whether the flight may take place. If in doubt as to the time remaining to maintenance tasks, or the acceptability of defects, the PIC must contact the person who last returned the aircraft to service.

13. Parts and Material Control

Parts required for elementary work and servicing shall be held under the control of the pilot / operator. Fuels, oils, lubricants and cleaning materials shall be kept in closed containers, clearly marked with the contents and handled in accordance with applicable industry recommendations. No fluids shall be dispensed from any unmarked container. All parts used by the Pilot / Operator or Maintenance Organization should be procured from established vendors. The parts must be accompanied with the proper documents to determine that they have been repaired, tested and /or overhauled in accordance to FAA regulations or equivalent. The parts are to be subjected to an incoming inspection to determine if any obvious defects exist and that the paperwork accompanying the part is correct.

14. Aircraft Weight & Balance Control

Each aircraft shall have a current weight and balance report with an up-to-date equipment list. Using this information, the center of gravity location and operational empty weight (OEW) shall be calculated.

15. Maintenance Arrangements

All aircraft maintenance shall be performed by the company's own authorized qualified maintenance technician, or an approved maintenance organization (AMO) holding proper license/ratings and training for the scope of the work to be undertaken. Each request for maintenance shall specify that the work be performed and certified in accordance with the applicable requirements of the Federal aviation regulations and in accordance with this document. The pilot/operator shall make all planned maintenance arrangements. This may

be done by completing a work order or similar document provided by the AMO. The AMO is required to maintain the proper manuals, parts, and training.

In the case of unplanned maintenance, the PIC may request an appropriately rated person perform the maintenance. The selection of any qualified maintenance technician or AMO to perform the maintenance is at the discretion of the PIC; however, he/she should confirm that they hold a certificate/license appropriate to the work to be done and that all of the specific scope and limitations of the work to be done are covered under the work order. If there is any doubt, they should seek the advice of the Company.

Note: the term "technician" is used in this context as an all-encompassing expression for maintenance personnel, "engineer" and "mechanic" being an acceptable alternative.

16. Aircraft Defects

The Certificate of Airworthiness of an aircraft is not in force if the aircraft has any malfunction or defect, unless the details of the malfunction or defect are recorded in the discrepancy log and unmistakable warning is given at the flight station by removing, placarding or tagging the affected item. In the case of deferred defects, the PIC shall assure him/her self that the affected equipment will still allow the flight to be conducted safely.

<p>Recommended Practices (RP) are published under the direction of the Helicopter Safety Advisory Conference (HSAC). RP's are a medium for discussion of aviation operational safety pertinent to the transmission of product, energy exploration and production industry in the United States. RPs are not intended to replace individual engineering or corporate judgment nor to replace instruction in company manuals or government regulations. Suggestions for subject matter are cordially invited.</p>
