

PILOT**RULES**

Maintenance, Airworthiness & MEL Manual

PilotRules Flight Academy · Southeast Aerial Systems

DOCUMENT	REVISION	EFFECTIVE
MAM	1	1 August 2026
MAINTAINED BY	APPLIES TO	REVIEW CYCLE
Director of Maintenance	Maintenance personnel, IPs, cadets	Annual

ELECTRONIC COPY — UNCONTROLLED IF PRINTED

Table of contents

1. Airworthiness responsibility
2. Organization & authority
3. Required documents & equipment
4. Inspection program
5. Squawk reporting
6. Squawk recording & tracking
7. Grounding authority
8. Inoperative equipment & the MEL
9. Deferral away from base
10. Return to service
11. Maintenance records
12. Servicing standards
13. Turbine-specific requirements — PC-12
14. Quality assurance & continuous improvement

1 Airworthiness responsibility

1.1 Purpose and scope

This manual establishes how PilotRules Flight Academy, operated by Southeast Aerial Systems, keeps its training fleet in an airworthy condition and how every person who touches an aircraft contributes to that outcome. It applies to all maintenance personnel, to all instructor pilots (IPs), to all cadets, and to contract facilities performing work on academy aircraft. It governs the Cessna 172 primary trainers, the Piper Seminole multi-engine trainers, and the Pilatus PC-12/45 and PC-12/47 turbine airplanes.

The academy is certificated as a pilot school under 14 CFR Part 141, and its aircraft are operated under Part 91. Nothing in this manual relieves any person of a regulatory obligation. Where this manual is more restrictive than the regulation, the manual governs. Where the regulation is more restrictive, the regulation governs, and the Director of Maintenance (DOM) is to be notified of the conflict so the text can be corrected at the next revision.

1.2 What "airworthy" means here

An aircraft is airworthy when two conditions are satisfied at the same time. First, the aircraft conforms to its type certificate, including all supplemental type certificates, field approvals, and applicable Airworthiness Directives issued under Part 39. Second, the aircraft is in a condition for safe operation, meaning that wear, deterioration, damage, and missing or inoperative items have been evaluated and found acceptable. A conforming aircraft that is not in a condition for safe operation is not airworthy, and neither is an aircraft in apparently good condition that does not conform to its approved configuration.

1.3 Owner and operator responsibility

Under 14 CFR §91.403, the owner or operator of an aircraft is primarily responsible for maintaining it in an airworthy condition, including compliance with Airworthiness Directives. Southeast Aerial Systems holds that responsibility for every aircraft it owns, leases, or operates in the training program, and it discharges the responsibility through the maintenance organization described in Section 2. Section §91.405 further requires the operator to have inspections performed, to ensure that maintenance personnel make the appropriate record entries, to have discrepancies repaired between required inspections, and to have inoperative instruments and equipment repaired, replaced, removed, or inspected at the next required inspection.

Responsibility cannot be delegated away by contracting the work out. When maintenance is performed by an outside repair station or an independent mechanic, Southeast Aerial Systems remains the responsible party and must be able to demonstrate that the work was properly ordered, properly performed, and properly recorded.

1.4 Pilot in command responsibility

Under §91.7, no person may operate a civil aircraft unless it is in an airworthy condition, and the pilot in command is responsible for determining whether the aircraft is in a condition for safe flight. The same

section requires the pilot in command to discontinue the flight when an unairworthy mechanical, electrical, or structural condition occurs. On dual training sorties the IP is the pilot in command unless the sortie has been specifically authorized as a solo or as a supervised pilot-in-command flight; on solo sorties the cadet is the pilot in command and carries the full weight of the determination.

WARNING

A pilot in command may not begin a flight in an aircraft with a known unairworthy condition. No schedule pressure, checkride deadline, stage-check backlog, or verbal assurance from any person — including a supervisor, an IP, or a mechanic — authorizes departure with a known unairworthy condition. If the aircraft is not airworthy, the flight does not launch. A pilot who accepts an aircraft is affirming the determination personally and may not attribute it to someone else afterward.

1.5 Director of Maintenance and Chief Inspector

The DOM holds the airworthiness authority of the operator. The DOM owns the inspection program, the Airworthiness Directive compliance program, the deferral decisions, and the release of aircraft to the flight schedule. The Chief Inspector is independent of production pressure and owns inspection standards, the acceptance of completed work, the second-person inspection program described in Section 10, and the internal audit findings described in Section 14. The Chief Inspector may reject work or an aircraft that the DOM has already accepted; that disagreement is resolved in favor of the more conservative position and is documented.

1.6 Maintenance Controller

The Maintenance Controller is the day-to-day operational link between the flight line and the hangar. The Controller monitors incoming squawks, applies the initial triage, tracks hours remaining to the next inspection on every airframe, engine, and propeller, coordinates parts and outside services, and advises the Director of Operations and the Operations Support Section (OSS) on fleet availability. The Controller may ground an aircraft at any time and may recommend a deferral, but the deferral decision itself rests with the DOM or the Chief Inspector.

1.7 Determining airworthiness before dispatch

Airworthiness is determined fresh before each dispatch, not once per day and not once per inspection cycle. The pre-dispatch determination is a sequence, and each step must produce an affirmative answer before the next one matters.

PRE-DISPATCH AIRWORTHINESS SEQUENCE

1. Inspection status current — annual, 100-hour, and all calendar and cycle items within limits.
2. Airworthiness Directives current, including the next-due point of every recurring AD.
3. Discrepancy record reviewed — no open grounding item, every deferral properly documented and placarded.
4. Required documents aboard and required equipment operative for the intended kind of flight.
5. Preflight inspection completed by the pilot in command against the approved checklist.
6. Pilot in command's personal determination that the aircraft is in a condition for safe flight.

The electronic dispatch record produced by the ops console supports steps one through three, but it does not replace them. A green indicator on a screen is evidence that the office believes the aircraft is releasable; it is not the pilot in command's determination and it does not survive a discrepancy discovered on the ramp. Cadets are taught from the first sortie that the screen informs the decision and the pilot makes it. Related standards for crew conduct and dispatch are in the **General Operations Manual**, and the checklists used for the preflight inspection are published at [/checklists](#).

2 Organization & authority

2.1 Reporting structure

The Wing Commander, who also serves as Commandant, is the owner and responsible manager of Southeast Aerial Systems and is accountable for the resources the maintenance organization needs. The DOM reports directly to the Wing Commander and not to the Director of Operations, so that maintenance decisions are never subordinated to the flying schedule. The Chief Inspector also reports directly to the Wing Commander for inspection and quality matters, preserving independence from the production line. All other maintenance positions report to the DOM through the Assistant Director of Maintenance.

2.2 Positions, duties, and authority

The table below is the controlling statement of who may take each of the four consequential actions in this manual: deferring a discrepancy, grounding an aircraft, approving a return to service, and signing a maintenance record. Authority is personal and may not be lent, delegated informally, or exercised by someone acting "on behalf of" the holder.

TABLE 2-1 · MAINTENANCE POSITIONS AND AUTHORITY

POSITION	REPORTS TO	PRINCIPAL DUTIES	SPECIFIC AUTHORITY HELD
Wing Commander / Commandant	Owner	Accountable executive; resources the maintenance organization; approves this manual and its revisions.	May ground. May not defer, return to service, or sign maintenance records unless separately certificated to do so.
Director of Maintenance	Wing Commander	Owns the inspection program, AD compliance, deferral policy, contract maintenance oversight, and fleet release.	May defer, ground, and — when holding the appropriate mechanic certificate and ratings — approve return to service and sign records.
Assistant Director of Maintenance	DOM	Runs the hangar day to day, assigns work, manages manpower and shift turnover.	May ground. May defer only when the DOM is unavailable and the deferral is reported to the DOM within 24 hours. Return to service per certificate held.
Chief Inspector	Wing Commander	Inspection standards, acceptance of completed work, second-person inspections, audit findings, calibration and shelf-life control.	May defer and may ground. Approves return to service within certificate privileges. May overrule acceptance of any work.
Maintenance Controller	DOM	Squawk triage, inspection-due tracking, parts and outside service coordination, availability reporting to the OSS.	May ground. May recommend but not authorize a deferral. No return-to-service authority in this role.
Quality Assurance Inspector	Chief Inspector	Internal audits, corrective action tracking, receiving inspection, parts traceability, reliability data.	May ground. May reject parts and completed work. Return to service per certificate held.

POSITION	REPORTS TO	PRINCIPAL DUTIES	SPECIFIC AUTHORITY HELD
A&P Mechanic	Assistant DOM	Performs scheduled and unscheduled maintenance and preventive maintenance in accordance with approved data.	May ground. Approves return to service for work performed within the privileges of the certificate held. Signs the record for that work.
Records Clerk	DOM	Maintains the aircraft records required by §91.417, files entries, manages retention and transfer, supports audits.	No airworthiness authority. May not sign for maintenance. May place an administrative hold when a required record is missing.
Logistics / Quartermaster	DOM	Procurement, receiving, stores, shelf-life stock rotation, tool issue and calibration recall.	May quarantine or reject stock. No airworthiness authority over aircraft.
Chief Instructor	Director of Operations	Training standards and instructor supervision; qualified under §141.35.	May ground. May not defer or return an aircraft to service.
Director of Operations / OSS	Wing Commander	Scheduling, dispatch, crew assignment; receives availability status from the Maintenance Controller.	May ground. May not defer, reverse a grounding, or return an aircraft to service.
Director of Safety	Wing Commander	Safety Management System, hazard and trend analysis, investigation of maintenance-related events.	May ground. May direct a fleet-wide inspection pending trend analysis. May not defer or return to service.
Pilot in command	—	Determines airworthiness for the flight under §91.7; reports every discrepancy discovered.	May ground the aircraft assigned for that flight. No deferral, record-signing, or return-to-service authority.

2.3 Qualification requirements

The DOM, Assistant DOM, and Chief Inspector each hold a mechanic certificate with airframe and powerplant ratings. The Chief Inspector and at least one other member of the organization hold Inspection Authorization, which is required to approve an annual inspection and to approve major repairs and major alterations for return to service. Personnel performing maintenance on the PC-12 airframe complete the manufacturer's type-specific maintenance training and are current on the applicable maintenance manual revision. Personnel performing work on the PT6A-67B or PT6A-67P engines work to the engine manufacturer's published instructions and hold the engine familiarization or field maintenance training appropriate to the tasks assigned.

The Records Clerk and the Logistics/Quartermaster do not require a mechanic certificate but complete internal training on §91.417 recordkeeping, on parts traceability documentation, and on the electronic record system before working unsupervised. Every member of the maintenance organization completes annual recurrent training that covers this manual, human factors in maintenance, regulatory changes, and lessons learned from the previous year's audit findings and safety reports.

2.4 Contract and third-party maintenance

Work sent outside the organization — avionics, propeller overhaul, engine overhaul, non-destructive testing, altimeter and transponder certification, and away-from-base repairs — is controlled by the DOM through an approved vendor list. A facility is added to the list only after the Quality Assurance Inspector verifies its certificate status, ratings and limitations, capability for the specific task, and quality system. The list is reviewed annually.

Every outside work order states the task, the applicable approved data, and the required documentation to be returned. On receipt, the Quality Assurance Inspector verifies that the returned record satisfies §43.9, that any airworthiness approval tags accompany installed parts, and that the work matches what was ordered before the aircraft is released. An aircraft returning from a contract facility is not dispatched until this verification is complete and recorded.

NOTE

A vendor's approval for return to service is valid on its own terms, but it does not discharge the academy's obligation under §91.403. The receiving inspection exists to confirm that the operator's records are complete and correct, not to second-guess the vendor's certificate privileges.

3 Required documents & equipment

3.1 Documents that must be aboard

The documents required aboard a standard-category civil aircraft are commonly recalled with the mnemonic ARROW. Cadets verify them on every preflight and IPs verify them on every dual sortie.

- **A** — Airworthiness certificate, displayed at the cabin or cockpit entrance so it is legible to passengers and crew. It has no expiration date but remains effective only while the aircraft is maintained in conformity with its type certificate and in a condition for safe operation.
- **R** — Registration certificate, current and matching the aircraft. Registration must be renewed before it expires; the Records Clerk tracks expiration dates and initiates renewal well in advance.
- **R** — Radio station license. Not required for domestic operations. It is required for flights outside the United States, and the academy carries it aboard the PC-12 fleet because those airplanes are the ones used for cross-border operations.
- **O** — Operating limitations. For the fleet this means the FAA-approved Airplane Flight Manual or Pilot's Operating Handbook containing the approved flight manual material, together with any placards, markings, and flight manual supplements associated with installed supplemental type certificates.
- **W** — Weight and balance data, current as of the most recent weighing or equipment change, including the current equipment list.

A missing or superseded document is a squawk. A missing airworthiness certificate, registration certificate, or approved flight manual grounds the aircraft; the flight may not depart while the document is absent.

3.2 Required instruments and equipment under §91.205

Section §91.205 lists the instruments and equipment that must be installed and in operable condition for powered civil aircraft with a standard airworthiness certificate, by kind of operation. The list below is the working summary used on the flight line. It is a summary and not a substitute for the regulation; when a question arises, the regulation and the aircraft's equipment list govern.

TABLE 3-1 · §91.205 REQUIRED EQUIPMENT BY KIND OF OPERATION

ITEM	DAY VFR	NIGHT VFR	IFR
Airspeed indicator	REQ	REQ	REQ
Altimeter	REQ	REQ	Sensitive altimeter adjustable for barometric pressure
Magnetic direction indicator	REQ	REQ	REQ
Tachometer for each engine	REQ	REQ	REQ

ITEM	DAY VFR	NIGHT VFR	IFR
Oil pressure gauge for each engine using a pressure system	REQ	REQ	REQ
Oil temperature gauge for each air-cooled engine	REQ	REQ	REQ
Temperature gauge for each liquid-cooled engine	If installed type	If installed type	If installed type
Manifold pressure gauge for each altitude engine	REQ	REQ	REQ
Fuel quantity indicator for each tank	REQ	REQ	REQ
Landing gear position indicator (retractable gear)	Seminole, PC-12	Seminole, PC-12	Seminole, PC-12
Anticollision light system (aviation red or white)	Per certification date of the airplane	REQ	REQ
Approved safety belt for each occupant two years of age or older	REQ	REQ	REQ
Shoulder harness for each front seat (small airplanes manufactured after 18 July 1978)	REQ	REQ	REQ
Emergency locator transmitter, if required by §91.207	REQ	REQ	REQ
Flotation gear and a pyrotechnic signaling device — for hire, over water beyond power-off gliding distance from shore	CONDITIONAL	CONDITIONAL	CONDITIONAL
Position lights	—	REQ	REQ
Electric landing light — required when operated for hire	—	REQ	REQ
Adequate source of electrical energy for installed equipment	—	REQ	REQ
Spare set of fuses, or three spares of each kind required, accessible in flight	REQ	REQ	REQ
Two-way radio communication and navigation equipment suitable for the route	—	—	REQ
Gyroscopic rate-of-turn indicator	—	—	REQ
Slip-skid indicator	—	—	REQ
Clock displaying hours, minutes, and seconds	—	—	REQ

ITEM	DAY VFR	NIGHT VFR	IFR
Generator or alternator of adequate capacity	—	—	REQ
Gyroscopic pitch and bank indicator (attitude indicator)	—	—	REQ
Gyroscopic direction indicator	—	—	REQ

NOTE

Where an installed system performs the function of a listed instrument by a different means — for example, an electronic flight display presenting attitude, heading, and rate of turn — the airplane's approved flight manual, flight manual supplements, and equipment list define what satisfies the requirement and what the reversionary and standby requirements are. Cadets are taught to read the requirement functionally and then confirm it against the approved data for the specific airplane.

3.3 Emergency locator transmitter

Section §91.207 requires an approved automatic-type emergency locator transmitter in operable condition, with limited exceptions. The battery must be replaced or recharged when the transmitter has been in use for more than one cumulative hour or when fifty percent of its useful life has expired, and the replacement date must be legibly marked on the outside of the transmitter and entered in the aircraft maintenance record. Each ELT installation is inspected within the preceding twelve calendar months for proper installation, battery corrosion, operation of the controls and crash sensor, and sufficient signal radiated from its antenna.

An ELT may be removed for inspection, repair, modification, or replacement, and the aircraft may be operated without it for a limited period defined in the regulation, provided the record entry is made and the placard required by that section is displayed in view of the pilot. The Maintenance Controller tracks ELT removals as a dated, time-limited condition and returns the unit to the aircraft before the period expires. Any inadvertent ELT activation discovered on the ground is silenced immediately, reported, and written up.

3.4 Altimeter, static system, and transponder checks

For IFR operation in controlled airspace, §91.411 requires that the static pressure system, each altimeter instrument, and the automatic pressure altitude reporting system have been tested and inspected within the preceding twenty-four calendar months in accordance with the procedures in Part 43. Those tests are performed by the airplane manufacturer, by an appropriately rated and equipped certificated repair station, or — for the static pressure system tests and inspections only — by a certificated mechanic with an airframe rating.

Section §91.413 requires that the ATC transponder have been tested and inspected within the preceding twenty-four calendar months in accordance with the applicable Part 43 procedures, performed by an

appropriately rated facility. The academy schedules both checks together to keep the due dates aligned, and the Maintenance Controller carries both as calendar items on the fleet status board. A lapsed altimeter or transponder check does not by itself ground the airplane for day VFR training, but it removes the airplane from the IFR schedule and from operations requiring transponder use, and it is recorded as a deferred item with the affected operations placarded.

3.5 VOR equipment checks

Section §91.171 prohibits IFR operation using VOR equipment for navigation unless that equipment has been operationally checked within the preceding thirty days and found to be within the applicable tolerance. Acceptable methods include a VOR test facility, a designated ground checkpoint, a designated airborne checkpoint, a dual-system cross-check, and a check over a prominent ground landmark on a published radial. The tolerances differ by method and are published in the regulation and on the airport's checkpoint listing.

Each check is logged with the date, the place, the bearing error, and the signature of the person performing it. The academy keeps a bound VOR check log in each IFR-capable airplane rather than relying on loose entries, and the IP verifies the currency of the log during the IFR preflight. A VOR check that exceeds tolerance is a squawk, not a note in the log; the equipment is written up and the airplane is not used for IFR training on that equipment until the discrepancy is resolved.

4 Inspection program

4.1 Inspection basis by fleet type

Academy aircraft are used to give flight instruction for hire and, in the case of the PC-12, to carry persons for hire on approved training and transition operations. Under §91.409(b), an aircraft used for those purposes must have received a 100-hour inspection within the preceding 100 hours of time in service and been approved for return to service, in addition to the annual inspection required by §91.409(a). The 100-hour limitation may be exceeded by not more than ten hours while en route to reach a place where the inspection can be done, and the excess time is deducted from the next 100-hour interval.

TABLE 4-1 · INSPECTION BASIS BY TYPE

TYPE	ROLE	INSPECTION BASIS	CONTENT AND ADDITIONAL TASKS
Cessna 172	Primary trainer	Annual under §91.409(a) and 100-hour under §91.409(b).	Manufacturer's inspection checklist at least as inclusive as the Part 43 appendix scope, plus manufacturer's progressive-care items, ADs, and airworthiness limitations.
Piper Seminole	Multi-engine trainer	Annual under §91.409(a) and 100-hour under §91.409(b).	Manufacturer's 50/100/500/1000-hour inspection groups applied on the airframe schedule, plus landing gear rigging and retraction checks at the published intervals.
Pilatus PC-12/45 and /47	Turbine trainer and transport	Annual and 100-hour basis, with the content drawn from the manufacturer's scheduled maintenance program.	Manufacturer's phased inspection tasks by hours, cycles, and calendar; engine manufacturer's scheduled tasks for the PT6A-67B or PT6A-67P; airworthiness limitations and life-limited components.
Any type, by election	—	Progressive inspection under §91.409(d).	Requires a written request to the FSDO, a current inspection procedures manual, adequate housing and equipment, and completion of a complete inspection of the airplane within each twelve calendar months.

The PC-12 is a single-engine turbine airplane below the weight threshold that triggers the large-airplane and multiengine-turbine inspection program provisions of §91.409, so the academy does not claim relief under those provisions. It is inspected on the annual and 100-hour basis, and the manufacturer's scheduled maintenance program supplies the content of those inspections and all of the additional interval-driven tasks. Where the academy elects a progressive inspection under §91.409(d) for a specific airframe, the election, the FSDO correspondence, and the inspection procedures manual are held by the DOM, and a change to an approved inspection program is processed before the change takes effect rather than after.

4.2 Who maintains the program

The DOM owns the inspection program and is the only person who may change it. The Chief Inspector owns the checklists used to execute it and verifies annually that each checklist still matches the current revision of the manufacturer's maintenance data. The Maintenance Controller executes it day to day, and

the Records Clerk files the resulting entries. Revisions to manufacturer maintenance manuals, service bulletins, and service letters arrive through a subscription managed by the Records Clerk; each revision is reviewed by the Chief Inspector within thirty days for its effect on the inspection program, and the review is recorded whether or not a change results.

4.3 Tracking hours, cycles, and calendar items

Every aircraft carries three independent clocks. Time in service accumulates from the moment the airplane leaves the surface until it touches down, and it is the basis for the annual and 100-hour intervals, component times, and time since overhaul. Cycles accumulate per takeoff and landing, and on the PC-12 the engine also accumulates starts and thermal cycles that drive life-limited component retirement. Calendar time drives the annual inspection, the ELT inspection, the altimeter and transponder checks, hose and flexible line replacement, fire extinguisher servicing, oxygen system checks, battery capacity checks, and emergency equipment inspection.

The Maintenance Controller reconciles the electronic tracking record against the aircraft's Hobbs and tach readings and against the flight records at least weekly, and a discrepancy of more than 0.2 hour is investigated before the aircraft flies again. Each aircraft's status card shows hours remaining to the next inspection, the nearest calendar item, and the nearest cycle-driven item, and the smallest of those three is what the OSS uses for scheduling. An aircraft within ten hours of an inspection is not released on a cross-country sortie that could exceed the remaining time.

4.4 Airworthiness Directive compliance

Airworthiness Directives are issued under Part 39 and are mandatory. No person may operate a product to which an AD applies except in accordance with the requirements of that AD. Each aircraft has an AD compliance record listing every applicable AD by number and revision, the method of compliance, the date and time in service at compliance, and, for recurring ADs, the time and date when the next action is required. That record is a permanent record and travels with the aircraft.

The Records Clerk performs a documented AD search for every airframe, engine, propeller, and appliance at each annual inspection and whenever a new AD affecting the fleet is issued. Recurring ADs are loaded into the tracking system as scheduled tasks with the same weight as an inspection item, and an overdue recurring AD grounds the aircraft. An alternative method of compliance is used only when it has been approved as provided in Part 39, and the approval document is filed with the compliance record. Emergency ADs are actioned on receipt; the Maintenance Controller grounds every affected airframe immediately and the DOM determines the return-to-service path.

4.5 Life-limited parts and overhaul intervals

Life-limited parts are retired at their published limit without extension. The airworthiness limitations section of the manufacturer's instructions for continued airworthiness is mandatory, and the academy tracks each limited component by part number, serial number, installation date, installed time and cycles,

and remaining life. On the PC-12, life-limited engine components tracked by cycles are the most schedule-sensitive items in the fleet, and the Maintenance Controller reports remaining cycles monthly to the DOM.

Reciprocating engine and propeller overhaul intervals are treated as follows. The manufacturer's recommended time between overhaul is not mandatory for a Part 91 operation, but the academy operates its trainers to the manufacturer's recommended interval as a matter of policy because the aircraft are flown by students in a high-cycle training environment. Propellers are overhauled at the manufacturer's published hour or calendar interval, whichever comes first. Turbine engine overhaul and hot-section intervals for the PT6A are tracked to the interval published in the engine manufacturer's current service information applicable to the specific engine model, adjusted for the operating environment, and are described further in Section 13. Any decision to operate beyond a recommended interval requires written DOM approval supported by trend data, oil analysis, and borescope results, and it is recorded.

4.6 Pre-dispatch status check

Before the first sortie of each day, the Maintenance Controller reviews every aircraft on the schedule against the inspection tracking record and publishes the fleet status to the OSS and to the ops console. The check confirms inspection currency, AD currency, the status of every open and deferred discrepancy, the currency of the calendar items in Section 3, and that any required placards are installed. An aircraft that fails any element of the check is removed from the schedule before crews arrive, not after they have preflighted it.

5 Squawk reporting

5.1 The duty to report

Every cadet, IP, mechanic, and staff member who observes a discrepancy on an academy aircraft has an affirmative duty to report it. The duty applies regardless of how minor the item appears, how obvious it seems that someone else must already know about it, how close it is to the end of the duty day, or whether the observer believes it will affect the flight. A discrepancy is any condition in which the aircraft, its systems, its equipment, its documents, or its interior differs from the expected serviceable condition. This includes items that are annoying rather than dangerous — a loose trim panel, a scratched display lens, a sticky microphone switch, a seat that will not lock cleanly on its rails.

The reason the standard is set this low is that the maintenance organization cannot see trends it is never told about. A single loose panel is trivial. The same panel loose on four airframes is a fastener problem, and the only way that pattern becomes visible is if all four are written up. Cadets are graded on the completeness of their write-ups during the preflight and post-flight portions of a sortie, and a cadet is never criticized for reporting something that turns out to be normal.

5.2 A squawk is never resolved verbally

No discrepancy is closed by conversation. A mechanic saying "that's normal on this airframe," an IP saying "we know about that one," or a Maintenance Controller saying "it's already on the list" does not close a squawk and does not satisfy the reporter's duty. If the condition is known, it already exists in the electronic record and the reporter's submission is linked to it as a duplicate, which is itself useful data. If it is not in the record, the conversation just demonstrated that it needed to be reported.

The corollary applies to maintenance as well. Work performed on an aircraft is not complete until the record entry is made, and a discrepancy is not resolved until the resolution is recorded and the entry is signed by a person authorized to make it. The physical aircraft and the paper record are two halves of the same airplane, and an airplane with only one of them is not dispatchable.

5.3 Filing a squawk

Squawks are filed through the online reporting form at [/maintenance](#). The reporter signs in so the maintenance organization can follow up with the person who actually saw the condition. The form captures the following, and each field is answered as specifically as the reporter can manage.

TABLE 5-1 · REQUIRED CONTENT OF A SQUAWK

FIELD	WHAT IS REQUIRED
Aircraft	The specific airframe, selected from the fleet list. Never a type — a discrepancy belongs to a tail, not to a model.
Date and time	Captured automatically at submission. If the condition was observed earlier, the description states when.

FIELD	WHAT IS REQUIRED
Phase of flight when found	Preflight, run-up or taxi, in-flight, post-flight, or other. This is the field that most often tells maintenance where to look.
Category	Engine or propeller; avionics or instruments; electrical; airframe or structure; landing gear, brakes, or tires; fuel system; flight controls; interior or cabin; lights; or other.
Severity	Safety of flight, significant, monitor or minor, or informational. Severity definitions are in Section 6.3.
Hobbs and tach	Recorded when known. These fix the discrepancy to a point in the aircraft's time in service.
Description	What was observed, exactly where, under what conditions, and what the observer did about it. Values and units where they exist.
Repeatability	Whether the condition repeated, and if so what reproduced it: a power setting, an airspeed, a temperature, a control input, a switch position, or a phase of flight.

Description quality determines how quickly the item is fixed. "Radio bad" produces a shop visit that finds nothing. "Number two comm transmits but receives with a loud hum above 2,300 RPM, clears below 2,000 RPM, both headsets, repeatable four times" produces a targeted troubleshoot. Cadets are taught to write the second kind from the first week of the program.

WARNING

A cadet or an IP may not clear, close, downgrade, or delete their own squawk, and may not clear anyone else's. Only a person authorized under Section 10 to approve a return to service may close a discrepancy, and only after the corrective action has been performed and recorded. Reopening the flight schedule is never a reason to close an item. Any attempt to pressure a reporter into withdrawing a squawk is reported directly to the Director of Safety.

5.4 Discrepancies discovered away from base

When a discrepancy is discovered away from base, the pilot in command first decides whether the aircraft is airworthy for any flight at all. If it is not, the aircraft stays where it is. The pilot then files the squawk through /maintenance if connectivity permits, and in every case telephones the Maintenance Controller. Voice contact is required in addition to the electronic filing because an away-from-base item usually needs a decision, and a decision cannot be made by a queue.

The pilot does not arrange local maintenance, authorize work, or accept a return to service on the academy's behalf. Those actions are taken by the DOM or the Maintenance Controller, who selects the facility, issues the work order, and specifies the documentation required. If the airplane cannot be repaired and cannot lawfully be flown, the crew arranges ground transportation home and the airplane is recovered separately. Section 9 covers deferral away from base in detail.

5.5 Acknowledgement timelines

The Maintenance Controller acknowledges every squawk in the electronic record. A safety-of-flight item is acknowledged immediately and in no case later than thirty minutes during operating hours; the aircraft is grounded automatically on submission, so acknowledgement confirms the grounding rather than creating it. A significant item is acknowledged within four operating hours. Monitor and informational items are acknowledged by the end of the next operating day. Acknowledgement is not resolution; it is confirmation that a named person now owns the item.

If a reporter has not seen an acknowledgement within these windows, the reporter contacts the Maintenance Controller directly and, failing that, the DOM. Silence is not evidence that an item was reviewed and judged unimportant.

6 Squawk recording & tracking

6.1 The discrepancy log and the electronic record

Each aircraft carries a discrepancy log in the cabin. It is the record of first resort: a pilot who finds something on the ramp writes it in the log immediately, before leaving the aircraft, so that the next crew to open the door sees it even if they never open a browser. The log entry does not replace the electronic filing at /maintenance; both are made.

The electronic record in the ops console is the controlling record. It holds the squawk identifier, the aircraft, the reporter and the reporter's role, the discovery phase, the category, the severity, the Hobbs and tach readings, the description, the current workflow state, the triage notes, and the resolution. It timestamps every state change and every edit, and it retains prior versions. Nothing in the electronic record is deleted; an item entered in error is closed with a resolution explaining the error.

6.2 Workflow states

Every squawk occupies exactly one of four states. The states are not a priority scale — they describe the aircraft's dispatch condition with respect to that item.

TABLE 6-1 · SQUAWK WORKFLOW STATES

STATE	MEANING	WHO MAY MOVE IT HERE	EVIDENCE REQUIRED
OPEN	Reported and acknowledged; triage complete or in progress; no dispatch relief granted and no grounding applied.	Created by any reporter on submission. Returned to open by the Maintenance Controller, DOM, or Chief Inspector.	The original report. Triage note naming the owner and the intended disposition.
DEFERRED	Repair is postponed under an authorized deferral. The aircraft may be dispatched subject to the conditions and placards attached to the deferral.	DOM or Chief Inspector. Assistant DOM only when the DOM is unavailable, with notification within 24 hours.	The legal basis for the deferral under Section 8, the repair category and calculated due date where an MEL applies, the placard installed, any (M) or (O) procedure accomplished, and the record entry.
GROUNDED	The aircraft may not be dispatched. It is removed from the schedule and placarded.	Any A&P mechanic, the DOM, the Assistant DOM, the Chief Inspector, the Maintenance Controller, the Quality Assurance Inspector, the Director of Safety, the Chief Instructor, the Director of Operations, or the pilot in command for the flight in question.	A statement of the condition and the reason it precludes dispatch. Applied automatically by the system on any safety-of-flight severity.

STATE	MEANING	WHO MAY MOVE IT HERE	EVIDENCE REQUIRED
RESOLVED	Corrective action complete, recorded, and approved for return to service. The item no longer restricts dispatch.	Only a person authorized to approve a return to service under Section 10.	Description of the corrective action, parts used with traceability, the §43.9 record entry with signature and certificate number, results of any operational check, and removal of any placard.

Transitions are constrained. An item may move from open to deferred, from open to grounded, or from open to resolved. A deferred item may move to grounded at any time by any person holding grounding authority, and it moves to grounded automatically when its repair interval expires. A grounded item may move only to resolved — never directly to deferred, and never back to open. A resolved item may be reopened only by the Chief Inspector, and reopening creates a new linked record rather than erasing the old one.

6.3 Severity definitions

TABLE 6-2 · SEVERITY AND ITS DISPATCH EFFECT

SEVERITY	DEFINITION	AUTOMATIC EFFECT
SAFETY OF FLIGHT	A condition that affects, or may reasonably affect, the safe operation of the aircraft: engine or propeller anomalies, flight control irregularities, structural damage or suspected damage, fuel system defects, landing gear or brake malfunctions, loss of a required instrument or system, any turbine limit exceedance, or any condition the reporter cannot explain.	Grounds the aircraft immediately on submission. No dispatch until resolved.
SIGNIFICANT	A condition that degrades capability, reliability, or crew workload but does not by itself make the aircraft unsafe: a failed secondary radio, an intermittent light, a worn tire approaching limits, a persistent nuisance annunciation.	Triage within four operating hours. Dispatch only if the item is properly deferred under Section 8 or repaired.
MONITOR / MINOR	A cosmetic or comfort condition, or an early-stage wear indication being watched: a scuffed fairing, a loose placard, a seat cushion tear, a slow-reading fuel gauge within tolerance.	No dispatch effect provided no required equipment is affected. Scheduled into the next inspection.
INFORMATIONAL	An observation recorded for trend value with no current defect: an unusual but in-limits indication, a note about handling, a request for a configuration change.	No dispatch effect. Reviewed in the monthly reliability meeting.

NOTE

Severity is assigned by the reporter and may be raised — never lowered — by the Maintenance Controller during triage without the concurrence of the DOM or the Chief Inspector. Downgrading a severity is a documented decision with a named approver and a stated rationale.

6.4 Duplicates and recurring discrepancies

When a new squawk describes a condition already in the record, the Maintenance Controller links it as a duplicate rather than dismissing it. Duplicates are counted, and the count is visible on the parent item. A condition reported by four different cadets in a week is a different problem from the same condition reported once, even if the technical defect is identical.

A discrepancy is classified as recurring when the same condition on the same aircraft and the same system is reported again within ten flight hours or thirty calendar days of a resolution. A recurring item may not be closed with the same corrective action that failed the first time. The second occurrence requires troubleshooting to a root cause with the Chief Inspector's involvement, and the third occurrence within the same window grounds the aircraft until the root cause is identified and corrected, regardless of severity.

6.5 Trend escalation

The Maintenance Controller produces a monthly discrepancy summary by aircraft, by system category, by discovery phase, and by severity. Any of the following is escalated to the Director of Safety as a trend rather than handled as a series of individual items: three or more occurrences of the same condition across the fleet in a rolling ninety days; any recurring item that reaches a third occurrence; a rise in in-flight discovery relative to preflight discovery in a category, which suggests the preflight is not catching something it should; and any discrepancy pattern that correlates with a particular sortie profile, ramp, fuel source, or maintenance event.

The Director of Safety enters accepted trends into the hazard register maintained under the **Safety Management System**, where they are risk-assessed and assigned mitigations with owners and due dates. Maintenance data is one of the primary inputs to the academy's safety performance indicators, and the feedback loop closes when the Director of Safety reports the outcome back to the maintenance organization.

7 Grounding authority

7.1 Who may ground an aircraft

Grounding authority is deliberately broad. The academy would rather absorb an unnecessary cancellation than launch an aircraft that someone believed was unsafe and felt unable to stop. The following persons may ground any academy aircraft at any time, without seeking permission and without stating a technical justification beyond the observed condition:

- Any A&P mechanic employed by or working under contract to the academy.
- The Director of Maintenance and the Assistant Director of Maintenance.
- The Chief Inspector and the Quality Assurance Inspector.
- The Maintenance Controller.
- The Director of Safety.
- The Chief Instructor and the Director of Operations.
- The pilot in command, for the aircraft assigned to that flight.

A cadet who is not the pilot in command does not hold formal grounding authority, but a cadet who reports a safety-of-flight severity through /maintenance grounds the aircraft automatically through the workflow described in Section 6. In practical terms this means any cadet can stop an airplane, and cadets are told so explicitly during indoctrination. No cadet has ever been disciplined at this academy for grounding an aircraft in good faith, and none will be.

7.2 A grounding may not be casually reversed

Grounding is asymmetric by design. It is easy to apply and difficult to remove. Once an aircraft is grounded, only a person authorized to approve that aircraft for return to service under Section 10 may release it, and only after the underlying condition has been corrected or evaluated and the required record entry has been made. The person who applied the grounding cannot remove it merely because they changed their mind; if a grounding was applied in error, the correction still flows through the return-to-service process so that the evaluation is recorded.

No manager, scheduler, instructor, or executive may direct that a grounding be lifted. A grounding is not subject to appeal on operational grounds. If the DOM and another authorized person disagree about whether a condition warrants grounding, the aircraft stays grounded until the disagreement is resolved on the technical merits, and the resolution is recorded in the squawk.

WARNING

Operating an aircraft that has been grounded, removing a grounding placard without authority, or dispatching an aircraft whose electronic record shows a grounded item is a violation of this manual and is treated as a matter of airman integrity. It is reported immediately to the Wing Commander and the Director of Safety and results in removal from flight status pending investigation.

7.3 Placarding a grounded aircraft

A grounding is marked physically and electronically, and both must be present.

The physical marking is a red placard reading **AIRCRAFT GROUNDED — DO NOT FLY**, showing the aircraft registration, the date and time, the squawk identifier, the condition in one line, and the name and signature of the person applying it. The placard is installed on the control wheel or control column of the left pilot station so it cannot be missed by anyone occupying the seat. On the PC-12 a second placard is installed at the cabin door. Control locks and covers are not used as a substitute for the placard, because they are ordinary items that a crew may remove without thinking.

The electronic marking is the grounded state in the ops console, which suppresses the aircraft from dispatch, displays a grounded indicator on the fleet status view and on the public squawk board at /maintenance, and blocks the creation of new reservations against that airframe. Existing reservations are not silently cancelled; the OSS is notified so a human being can contact each affected crew.

7.4 Schedule removal and notification

When an aircraft is grounded, the Maintenance Controller notifies the OSS immediately with the registration, the time of grounding, the nature of the condition in plain language, and the best current estimate of return to service. The estimate is updated at least daily while the aircraft remains grounded, and an estimate that has slipped twice is escalated to the DOM for a recovery plan.

The OSS removes the aircraft from the schedule, reassigns affected sorties where another airframe and instructor are available, and notifies affected cadets and IPs. Where a grounding affects a stage check, an end-of-course check, or a checkride, the OSS notifies the Chief Instructor so the training record can be annotated and the event rescheduled without penalty to the cadet. Cadets are not charged for a sortie cancelled by a grounding, and a grounding-driven cancellation does not count against a cadet's completion timeline in the 52-week program.

If a grounding will remove more than one aircraft of a type from service at the same time, or will persist beyond seventy-two hours, the DOM notifies the Wing Commander and the Director of Operations directly so that the training pipeline can be re-planned rather than absorbed sortie by sortie.

8 Inoperative equipment & the MEL

8.1 The four lawful paths

Section §91.213 governs flight with inoperative instruments and equipment installed on an aircraft. It provides a small number of paths, and an aircraft with inoperative equipment must fit one of them or it does not fly:

1. Operation under an approved Minimum Equipment List (MEL) issued to the operator with a letter of authorization, as provided in §91.213(a).
2. Operation under §91.213(d) for those aircraft to which that paragraph applies, with the equipment removed or deactivated and placarded.
3. Operation under a special flight permit issued under Part 21, as contemplated by §91.213(c).
4. Repair or replacement of the item before flight — always available and always preferred.

There is no fifth path. An item that does not fit one of these is a grounding item, no matter how minor it seems.

8.2 Aircraft without an approved MEL — §91.213(d)

Paragraph (d) is the provision most light training aircraft operate under, and it is frequently misdescribed. It is not a general permission to fly with broken equipment. It applies only to flights that are not conducted under Parts 121, 125, 129, or 135, and only to a defined list of aircraft that includes non-turbine-powered airplanes for which a master minimum equipment list has not been developed. Every one of the following conditions must be satisfied before the aircraft may be flown.

- The inoperative item is not part of the VFR-day type certification instruments and equipment prescribed in the airworthiness regulations under which the aircraft was type certificated.
- The item is not indicated as required on the aircraft's equipment list or on the kinds of operations equipment list for the kind of flight being conducted.
- The item is not required by §91.205 for the specific kind of flight operation being conducted.
- The item is not required to be operational by an Airworthiness Directive.
- The inoperative item is removed from the aircraft, the cockpit control is placarded, and the maintenance is recorded in accordance with §43.9; or the item is deactivated and placarded **INOPERATIVE**. Where deactivation involves maintenance, that maintenance is performed and recorded under Part 43.
- A determination is made that the inoperative item does not constitute a hazard to the aircraft. That determination may be made by a pilot certificated and appropriately rated under Part 61, or by a person certificated and appropriately rated to perform maintenance on the aircraft.

At this academy the hazard determination is made by a mechanic, not by a cadet or an IP, even though the regulation permits a rated pilot to make it. The reason is consistency: a fleet operator cannot have twenty

pilots reaching twenty different conclusions about the same defect. The removal or deactivation and the placarding are likewise performed by maintenance personnel. Under §91.405, an item deferred this way must be repaired, replaced, removed, or inspected at the next required inspection; it does not accumulate indefinitely.

8.3 The turbine exclusion — why the PC-12 is different

By its own terms, §91.213(d) does not extend to turbine-powered airplanes. The Cessna 172 and the Piper Seminole are reciprocating-engine airplanes and are dispatched with inoperative equipment under paragraph (d) when the conditions above are met. The Pilatus PC-12 is turbine powered, and paragraph (d) is not available to it.

CAUTION

A PC-12 may be dispatched with inoperative equipment only under an approved MEL issued to Southeast Aerial Systems with its letter of authorization, or under a special flight permit. There is no §91.213(d) relief for a turbine airplane. If a PC-12 has an inoperative item and no MEL relief exists for it, the airplane is grounded. Any instruction to the contrary, from any source, is wrong.

The DOM also confirms with the Flight Standards District Office whether a master minimum equipment list has been published for any reciprocating type in the fleet before relying on paragraph (d) for that type, and the academy's standing preference is to obtain and operate under an approved MEL whenever one is available, because an MEL produces a more disciplined and better-documented deferral process than paragraph (d) does.

8.4 The MMEL, the MEL, and the letter of authorization

The Master Minimum Equipment List is developed by the FAA with the manufacturer for an aircraft type. It establishes, for that type, which items may be inoperative, under what conditions, for how long, and with what procedures. The MMEL is generic to the type and is not itself an operating document.

An operator's MEL is derived from the MMEL for its specific aircraft, configuration, and operations. It may be more restrictive than the MMEL but never less. It reflects the equipment actually installed on that airframe, and it incorporates the MMEL preamble, definitions, and the operator's own (M) and (O) procedures. The MEL becomes effective for the operator when the FAA issues a letter of authorization for that specific aircraft, and the MEL together with the letter of authorization is treated as approved data for that aircraft. An MEL prepared for one airframe does not authorize deferrals on another, even of the same type and configuration.

CAUTION

An approved MEL supersedes §91.205 for the aircraft to which it applies. Where the MEL permits dispatch with an item inoperative that §91.205 would otherwise require, the MEL governs, subject to every condition, limitation, and procedure it imposes. This relief exists only for the specific aircraft named in the letter of authorization and only while the MEL is carried aboard and complied with in full.

8.5 Repair categories

Every item in an MEL carries a repair category that fixes the maximum time the item may remain inoperative. The interval begins on the calendar day following the day the discrepancy was recorded — the day of discovery is not counted.

TABLE 8-1 · MEL REPAIR CATEGORIES

CATEGORY	REPAIR INTERVAL	NOTES
A	As specified in the remarks or exceptions column of the MEL for that item.	No standard interval. May be expressed in calendar days, flight hours, or cycles. Category A items may not be extended.
B	Three consecutive calendar days, excluding the day of discovery.	Typically applied to items with a meaningful effect on capability or redundancy.
C	Ten consecutive calendar days, excluding the day of discovery.	The most common category for equipment whose loss is operationally manageable.
D	One hundred twenty consecutive calendar days, excluding the day of discovery.	Applied to items with negligible effect on operation, such as certain passenger convenience items.

The Maintenance Controller calculates the due date at the moment of deferral, records it in the electronic record, and the system grounds the aircraft automatically at the expiry of the interval. An expired repair interval is not a paperwork lapse; the aircraft becomes undispachable at midnight on the due date whether or not anyone notices.

8.6 (M) and (O) procedures

An MEL item may be annotated (M), (O), or both. An (M) annotation means a specific maintenance procedure must be accomplished before operation with the item inoperative — typically isolating, deactivating, securing, or verifying the affected system. These procedures are normally performed by maintenance personnel; other personnel may perform them only if they are specifically qualified and authorized to do so. At this academy, (M) procedures are performed by maintenance personnel without exception.

An (O) annotation means a specific operations procedure must be accomplished, normally by the flight crew — for example, a limitation on the kind of flight, a required crew action, a required cross-check, or a required alternate source of information. The (O) procedure is briefed to the crew at dispatch, is written into the deferral record, and is briefed again by the pilot in command during the crew brief. An item annotated (O) is never deferred without confirming that the assigned crew has been given the procedure in writing.

Both kinds of procedure must be available to the crew, and neither is optional. Accomplishment of an (M) procedure is recorded under §43.9 by the person who performed it.

8.7 Deferral authority, extensions, and placards

Only the DOM or the Chief Inspector may authorize a deferral. The Assistant DOM may do so when the DOM is unavailable, with notification to the DOM within twenty-four hours. No pilot, scheduler, or manager may defer an item, and an item that has been grounded may never be converted to a deferral.

Whether a repair interval may be extended is determined by the approved MEL and the letter of authorization. Where an extension is permitted, it applies only to category B, C, and D items; it may be taken once for a given discrepancy; it may not exceed the length of the original interval; and it requires the DOM's written approval recorded in the electronic record with the reason. Category A items are never extended. An extension is a deliberate management decision, not an administrative renewal, and repeated extensions on the same system are reported to the Chief Inspector as a supply or planning failure.

Placards for inoperative equipment are printed, not handwritten. Each placard reads **INOPERATIVE** in legible capitals, is installed adjacent to the affected instrument or on the cockpit control of the affected item, is durable enough to survive the deferral period, and is installed in a manner that does not obscure another placard, marking, or instrument and does not interfere with any control. The placard is removed only when the item is repaired and the squawk is resolved. A deferral without a placard is not a valid deferral, and an aircraft found in service with an undocumented placard is grounded until the item is reconciled.

8.8 Carriage of the MEL

Where an aircraft is operated under an approved MEL, the MEL and the letter of authorization are carried aboard the aircraft and are available to the pilot in command, together with the records identifying the inoperative instruments and equipment and the information required to be provided to the pilot. An aircraft operated under an MEL that departs without the MEL aboard is not in compliance, and the absence of the MEL is itself a grounding condition until the document is restored to the airplane.

9 Deferral away from base

9.1 The situation this section addresses

Cadets fly cross-country sorties, and the PC-12 fleet operates routinely to airports where the academy has no maintenance presence. A discrepancy found at an outstation raises a different question from the same discrepancy at home: not only whether the airplane is airworthy, but whether it may lawfully be moved and by whom that decision is made.

The governing principle is that distance from home does not create authority. A pilot at an outstation has exactly the authority described in Section 2 — the authority to ground the aircraft for that flight and the duty to report — and no more. Deferral authority remains with the DOM and the Chief Inspector regardless of where the airplane is parked.

9.2 Required coordination before the flight continues

When a discrepancy is discovered away from base, the pilot in command performs the following sequence before any further flight:

1. Secure the aircraft and stop the sortie. No further flight until the sequence is complete.
2. File the squawk at /maintenance with the same detail required at home base, noting the location.
3. Telephone the Maintenance Controller. If the Controller is unreachable, telephone the DOM. If both are unreachable, telephone the Director of Operations, who will reach one of them.
4. Describe the condition, what was observed, what was checked, and the crew's own assessment of the aircraft's condition.
5. Wait for a decision. The decision is made by the DOM or the Chief Inspector, communicated verbally, and entered in the electronic record before the flight continues.

The pilot does not begin the return flight on the strength of a verbal "sounds fine to me." The deferral must exist in the record, with its basis, its conditions, and any placard requirement, before the airplane moves. Where the deferral requires a placard that the crew cannot fabricate to standard, the DOM specifies an acceptable interim marking and the permanent placard is installed on arrival.

9.3 When maintenance is available locally

If a certificated mechanic or repair station is available at the outstation, the Maintenance Controller may direct that the item be repaired rather than deferred. The Controller — not the crew — contacts the facility, describes the work, agrees the scope, and specifies the record entry required under §43.9 including the certificate number of the person approving the return to service. The crew's role is limited to providing access to the aircraft and to the aircraft records the mechanic needs.

The crew does not authorize additional work discovered during the repair. If the facility finds something further, it reports to the Maintenance Controller, who decides. On return to base, the Quality Assurance Inspector performs a receiving review of the outside work as described in Section 2.4.

9.4 Documentation

An away-from-base deferral carries the same documentary burden as one made in the hangar: the squawk record, the deferral basis under Section 8, the authorizing person's name, the repair category and due date where an MEL applies, the placard, any (M) or (O) procedure and who accomplished it, and the maintenance record entry. Where the (M) procedure cannot be accomplished because no mechanic is present, the item cannot be deferred and the airplane does not fly. The crew adds a note to the discrepancy log in the aircraft describing what was done and by whom, so the next crew has the picture without needing to reconstruct it from telephone calls.

9.5 Special flight permits

An aircraft that does not meet applicable airworthiness requirements but is capable of safe flight may be flown under a special flight permit issued under Part 21, commonly called a ferry permit. The permit is used to fly the aircraft to a place where repairs can be made, and it is issued with specific operating limitations — often restricting the route, the weather conditions, the crew complement, and the carriage of persons other than required crewmembers.

Only the DOM applies for a special flight permit. The application is made to the FSDO or through a designee authorized to issue it, and the airworthiness statement supporting the application is prepared by a person authorized to make it. Cadets never fly under a special flight permit. A ferry flight under a permit is flown by an IP designated by the Chief Instructor and briefed by the DOM on the permit's limitations, which are carried aboard the aircraft.

WARNING

A grounding item may not be deferred, at base or away from it. If the condition that grounded the aircraft still exists, the only lawful ways to move the airplane are to correct the condition and return it to service, or to obtain a special flight permit. Distance, weather, a scheduled checkride, an expensive overnight, or the inconvenience of recovering a crew by road are not factors in that decision and are not to be raised as arguments in the coordination call.

10 Return to service

10.1 Who may approve a return to service

Approval for return to service is a certificate privilege, not a job title. Under Part 43, the persons who may approve an aircraft or component for return to service after maintenance are limited, and at this academy the practical set is: a certificated mechanic with the appropriate airframe or powerplant rating for the work performed; the holder of an Inspection Authorization for an annual inspection and for major repairs and major alterations; and an appropriately rated certificated repair station acting within its ratings and limitations.

Preventive maintenance performed by a pilot under the limited authorization in Part 43 is not available on academy aircraft, because cadets and IPs are neither the owner nor the operator of these airplanes. Cadets do not perform maintenance of any kind, including tasks that appear trivial. Adding oil, checking tire pressure, and cleaning a windscreen are servicing tasks performed under Section 12 supervision and are not maintenance approvals.

10.2 The maintenance record entry under §43.9

Section §43.9 fixes the content of the record entry for maintenance, preventive maintenance, rebuilding, and alteration. Each entry made in the academy's records contains, at minimum:

- A description of the work performed, or a reference to data acceptable to the Administrator that describes it. The description must be specific enough that a reader in five years can tell what was done to the airplane.
- The date the work was completed.
- The name of the person who performed the work, where that person is not the person approving the return to service.
- If the work is approved for return to service, the signature, certificate number, and kind of certificate held by the person approving it. That signature constitutes the approval only for the work performed.

Academy entries add the aircraft total time in service at completion, the linked squawk identifier, the part numbers and serial numbers of parts installed and removed, and the airworthiness approval document reference for each installed part. Corrective action text is written to answer the reporter's original description: an entry that says "ops checked good" against a squawk describing an intermittent fault is rejected by the Chief Inspector and returned for rework of the entry.

10.3 Inspection sign-off under §43.11

Inspections conducted under Part 91 are recorded under §43.11. The entry states the type and extent of the inspection, the date, the aircraft total time in service, and the signature, certificate number, and kind of certificate of the person approving or disapproving the aircraft. When the aircraft is found airworthy, the entry includes the certification statement prescribed by that section. When the aircraft is not found

airworthy, the entry says so and the person performing the inspection provides the owner or operator a signed and dated list of the discrepancies and unairworthy items, which is referenced in the entry.

For items on that list that are permitted to be inoperative under §91.213(d)(2), the person performing the inspection installs a placard meeting the aircraft's airworthiness certification requirements on each inoperative instrument and on the cockpit control of each inoperative item, marking it inoperative. The academy files the discrepancy list with the inspection record and opens a squawk for each listed item so that nothing on the list can be lost between inspections.

10.4 Second-person inspection of critical work

Part 91 does not require an independent inspection of critical maintenance tasks. The academy imposes one anyway, because the training fleet is flown by low-time pilots who have the least margin to absorb a maintenance error. The following tasks require a second-person inspection by a different qualified individual, recorded in the work package with both names before the aircraft is released:

- Any work on primary or secondary flight controls, including cable, rod, bellcrank, hinge, trim, and flap system disturbance, and any rigging change.
- Any work affecting engine controls, propeller controls or governors, or fuel system continuity.
- Landing gear rigging, retraction system work, and brake system reassembly.
- Installation or reinstallation of engine, propeller, or major structural components.
- Any task the DOM or Chief Inspector designates for a specific work package.

The second person verifies correct assembly, correct hardware, correct torque and safetying, correct sense of control movement, and the absence of tools and foreign objects. The second inspection is a separate examination, not a conversation with the first mechanic.

10.5 Operational checks and check flights

Under §91.407, no person may carry any person other than crewmembers in an aircraft that has been maintained, rebuilt, or altered in a manner that may have appreciably changed its flight characteristics or substantially affected its operation in flight, until an appropriately rated pilot holding at least a private pilot certificate flies the aircraft, makes an operational check of the maintenance performed or alteration made, and logs the flight in the aircraft records.

At this academy, maintenance check flights are flown by an IP designated by the Chief Instructor from a standing list of qualified check pilots, briefed by the mechanic who performed the work, and flown with no cadets and no observers aboard. The DOM determines when a check flight is required; the default is that any control system rigging change, engine change, propeller change, or major structural repair requires one. Ground operational checks — engine runs, system functional tests, retraction tests on jacks, leak checks — are performed and recorded before the check flight, not in place of it. The check pilot's report is entered against the squawk and the aircraft is not released to the training schedule until the report is satisfactory.

10.6 Closing the electronic record

The final step of every return to service is closing the squawk in the ops console. The person approving the return to service, or the Records Clerk acting on that person's written entry, moves the item to **RESOLVED** and attaches the corrective action text, the record entry reference, the parts documentation, and the check-flight report where one exists. Any placard associated with the item is removed and its removal is noted. The Maintenance Controller verifies before the next dispatch that no item remains open against the aircraft that would restrict the intended operation. An aircraft is never released with the physical work complete and the record still open.

11 Maintenance records

11.1 The records the academy keeps

Section §91.417 requires the owner or operator to keep two families of records, and the distinction between them drives everything about how they are retained. The first family covers the maintenance, preventive maintenance, and alteration performed, and the inspections accomplished. The second family is the status record: the accumulated totals, current statuses, and compliance positions that describe the aircraft as it stands today. The Records Clerk maintains both under the DOM's direction.

TABLE 11-1 · RECORDS AND RETENTION

RECORD	FAMILY	RETENTION
Description of work performed, date of completion, and signature and certificate number of the person approving return to service	Work record	Until the work is repeated or superseded by other work, or for one year after the work is performed.
Records of 100-hour, annual, progressive, and other required or approved inspections	Work record	Until repeated or superseded, or one year. Retained longer as a matter of academy policy.
Total time in service of the airframe, each engine, each propeller	Status record	Retained permanently and transferred with the aircraft on sale.
Current status of life-limited parts of the airframe, engine, propeller, and appliances	Status record	Retained permanently and transferred with the aircraft on sale.
Time since last overhaul of items required to be overhauled on a specified time basis	Status record	Retained permanently and transferred with the aircraft on sale.
Current inspection status, including the time since the last inspection required by the inspection program	Status record	Retained permanently and transferred with the aircraft on sale.
Current status of applicable Airworthiness Directives, with AD number, revision date, method of compliance, and next due point for recurring ADs	Status record	Retained permanently and transferred with the aircraft on sale.
Copies of major repair and major alteration forms	Status record	Retained permanently and transferred with the aircraft on sale.
Squawk records, deferrals, placard log, and check-flight reports	Academy policy	Retained for the life of the aircraft in the academy fleet, minimum five years.
Parts traceability documents and airworthiness approval tags	Academy policy	Retained for the life of the installed part plus two years.

The academy exceeds the minimum retention periods deliberately. The one-year rule in the regulation is a floor set for a private owner; a Part 141 school with an internal audit program, an SMS, and a reliability process needs a longer history to see anything useful in its own data.

11.2 Permanent versus temporary records

Permanent records are those that must travel with the aircraft: the status family above, together with the airworthiness certificate, registration, weight and balance record and equipment list, supplemental type certificate documentation, and the major repair and alteration forms. They are stored in a fireproof cabinet in the records office and are duplicated in the electronic record system. Original paper is never carried aboard the aircraft; the aircraft carries copies where copies are acceptable and the originals stay in the office.

Temporary records are the work records — the individual entries, work orders, parts requisitions, and shop travelers. They are filed by aircraft and by date and are purged only on the DOM's written authority after the retention period has run. Nothing is purged while an audit, an investigation, or an unresolved discrepancy touches it.

11.3 Transfer of records

When an aircraft leaves the fleet by sale or lease return, the owner is required to transfer the status records to the purchaser. The Records Clerk assembles the complete record package, the Chief Inspector verifies its completeness against a transfer checklist, and the transfer is documented with a signed receipt identifying every document handed over. A copy of the transferred package is retained by the academy for three years after transfer. Where a record has been lost before transfer, the reconstruction — including the basis for any reconstructed total time in service — is documented and disclosed rather than quietly presented as original.

11.4 Electronic records and digital signatures

The academy maintains its records electronically with paper backup for the permanent family. The electronic system enforces named user accounts, role-based permissions, and an append-only audit trail; no user may alter or delete a prior entry, and a correction is made as a new dated entry referencing the original. Digital signatures are unique to one individual, are under that individual's sole control, and record the signer's name, certificate number, kind of certificate, and the date and time of signing. Shared accounts and shared credentials are prohibited.

The system is backed up daily to off-site storage, and a restoration test is performed twice a year and recorded. The Records Clerk verifies weekly that entries made in the shop have propagated into the electronic record and that no work package has been closed without its entries. Where the electronic system is unavailable, work continues on paper and the entries are transcribed within twenty-four hours of restoration, with the original paper retained.

11.5 Audit and quality review

The Quality Assurance Inspector audits a sample of records monthly: at least ten closed squawks, one complete inspection package, and one aircraft's AD compliance record. The audit checks that entries satisfy §43.9 and §43.11, that signatures and certificate numbers are present and legible, that parts documentation matches the parts installed, that deferral records are complete, and that the electronic

record matches the paper. Findings are entered into the corrective action system described in Section 14 and tracked to closure. The DOM reviews the audit results monthly and reports annually to the Wing Commander on the health of the records system. Records are made available for inspection by the Administrator or an authorized representative of the National Transportation Safety Board as required by §91.417.

12 Servicing standards

12.1 Fuel grades

TABLE 12-1 · APPROVED FUEL BY TYPE

AIRCRAFT	FUEL
Cessna 172	Aviation gasoline, grade 100LL (blue). No jet fuel under any circumstances.
Piper Seminole	Aviation gasoline, grade 100LL (blue). No jet fuel under any circumstances.
Pilatus PC-12/45 and /47	Jet A or Jet A-1 as approved in the airplane flight manual, with an approved fuel system icing inhibitor when required.

WARNING

Misfuelling destroys engines and kills crews. Jet fuel in a reciprocating engine causes detonation and power loss shortly after takeoff. Aviation gasoline in a turbine engine damages the engine and its fuel system. The person supervising the fuelling verifies the grade at the truck or pump placard, verifies the nozzle type, confirms the aircraft's fuel placard at the filler, and remains present throughout. Any aircraft suspected of having received the wrong fuel is grounded immediately, is not started, is not moved under its own power, and is written up as a safety-of-flight squawk. Defuelling and inspection are directed by the DOM.

The PC-12 requires an approved fuel system icing inhibitor blended at the concentration published in the airplane flight manual when fuel temperature is at or below 0 °C, unless the fuel already contains the additive. The additive is added during fuelling, into the flowing stream, never poured into a tank as a slug, and never allowed to contact painted surfaces or the crew's skin. The quantity added and the fuel uplifted are recorded on the fuelling ticket.

12.2 Grounding, bonding, and fuelling technique

Before the fuel cap is opened, the aircraft is bonded to the fuelling equipment and both are connected to an approved ground point. The bonding cable is attached to unpainted metal on the airframe, not to a propeller, antenna, static wick, or control surface. Bonding is disconnected only after the cap is secured. Fuelling stops immediately if a thunderstorm is within five nautical miles. No aircraft is fuelled with an engine running, with cadets or passengers aboard, or with the cabin heater or any electrical service in operation beyond what is required for fuel quantity indication.

12.3 Fuel sampling and contamination

Fuel is sampled from every drain point before the first flight of the day and after every refuelling, into a clear sampler, and examined for water, sediment, and correct color and odor. Samples are examined against a white background in daylight or under white light. Water in a sample requires repeated sampling until three consecutive samples are clean, and any airframe producing water on more than two

consecutive days is written up so the cause — a leaking cap seal, a failed drain, a contaminated source — can be found. Contaminated samples are not discarded onto the ramp; they go into the waste fuel container. Suspected contamination from a fuel source is reported to the Maintenance Controller, who notifies the fuel provider and identifies every aircraft fuelled from that source since the last clean sample.

12.4 Oil servicing

Oil is added only from a sealed container of the grade and specification listed in the approved flight manual for the airplane and the season. The container is checked for the correct part number before opening, and the empty container is retained until the aircraft has been signed off so the grade can be verified if a question arises.

On the PC-12, engine oil level is read in one of two valid windows. A MAX HOT check is made within ten minutes of engine shutdown, while the oil is still distributed as it is in operation. A MAX COLD check is made after the engine has been shut down for at least twelve hours, when the oil has fully drained back. A reading taken between those windows is meaningless and is not used to make a servicing decision. Oil consumption is logged after every flight and trended; a change in consumption rate is a write-up even when the level remains within limits.

CAUTION

Oil brands and types are not mixed. Mixing different turbine oil brands, or mixing mineral and ashless dispersant oils in a reciprocating engine, can cause additive incompatibility, sludging, and seal deterioration. The oil approved for each airframe is recorded on the servicing placard and in the aircraft's servicing record. A change of oil brand or type is a maintenance action authorized by the DOM in accordance with the engine manufacturer's instructions, including any required flushing, and it is recorded.

12.5 Tires, brakes, and batteries

Tire pressures are checked with a calibrated gauge at cold temperature at the intervals in the maintenance manual and whenever a tire looks low. A tire that has been run flat, has a flat spot through to the reinforcing ply, shows cord, or has cuts exceeding the manual's limits is replaced, not inspected optimistically. Brake wear is checked against the manufacturer's wear indicators; brake discs are examined for scoring, warping, and heat discoloration after any hard-braking event, which is itself a write-up.

Batteries are serviced according to the type installed on the individual airplane, which is recorded on the battery access placard. Electrolyte level checks, capacity checks, and replacement intervals follow the manufacturer's schedule and are tracked as calendar items. Charging is done off the aircraft, in the designated battery area, with the correct charger for the chemistry. Personal protective equipment is worn, and lead-acid and any nickel-cadmium servicing equipment is kept strictly separate to prevent electrolyte cross-contamination.

12.6 Oxygen servicing

Oxygen systems are serviced only with aviation breathing oxygen meeting the specification in the maintenance manual, by trained personnel, with the aircraft outside the hangar and no fuelling, electrical work, or ignition source within the designated radius. Hands, tools, fittings, and clothing must be free of oil, grease, and solvent, because hydrocarbons in the presence of high-pressure oxygen ignite. Cylinders are filled slowly to limit heat of compression, and the final pressure is corrected for temperature. Cylinder hydrostatic test dates and service life limits are tracked as calendar items by the Maintenance Controller.

12.7 Towing and ground handling

Aircraft are moved with the approved towbar for the type, by personnel trained on that type, with a wing walker whenever the aircraft is within one wingspan of an obstacle and always when moving in or out of the hangar. Brakes are checked before the tow begins and a person capable of applying them is at the controls whenever the aircraft is moved on a slope.

CAUTION

The PC-12 nose landing gear has defined nose wheel steering limits, and the towing linkage incorporates a shear pin that is designed to fail before the steering mechanism is damaged. Exceeding the marked turn limits during towing may shear the pin or damage the steering unit. Turn limits are observed at all times, the towbar is never used to force the nose wheel past the marks, and a sheared pin is a mandatory maintenance write-up — the aircraft is not returned to service until the gear and steering system have been inspected.

12.8 External power

External power is applied only from a unit of the correct voltage, polarity, and regulation for the airplane, meeting the current and voltage limits in the airplane flight manual. Polarity is verified before the plug is connected. The unit is stable and its output is within limits before connection, and it is not started or stopped while connected to the airplane. On the PC-12, external power is used for starting in accordance with the flight manual, and a start attempted on an external unit that cannot sustain the required current is a common cause of a hot start — the unit's capability is verified rather than assumed. Any suspected power quality event, including a voltage transient during connection or disconnection, is written up so the avionics can be checked.

13 Turbine-specific requirements — PC-12

13.1 Why the turbine fleet is managed differently

The PC-12/45 and PC-12/47, powered by the Pratt & Whitney PT6A-67B and PT6A-67P respectively, are the most capable and most expensive airframes in the fleet, and they are the aircraft on which cadets first meet turbine operations. A turbine engine gives very little warning through the senses that a piston engine gives freely; it does not run rough before it fails. Almost all of the warning it gives is in recorded data. The academy therefore manages the turbine fleet by data rather than by feel, and the cadet-facing side of that discipline is described in the PC-12 program page.

13.2 Engine condition trend monitoring

Engine condition trend monitoring is mandatory on every PC-12 sortie. The crew records a stabilized cruise data set — pressure altitude, outside air temperature, indicated airspeed, torque, propeller speed, gas generator speed, interstage turbine temperature, and fuel flow — in stable conditions with the inertial separator retracted and bleed configuration noted. Where the airplane's avionics record the parameters automatically, the crew confirms the recording was captured.

The data is uploaded after each flight and reduced against the engine manufacturer's method to produce corrected margins. What matters is not the absolute value on any one flight but the slope over time. A rising ITT margin trend at constant torque, a rising fuel flow at constant power, or a divergence between gas generator speed and torque indicates compressor deterioration, hot-section distress, or an instrumentation fault, and each of those is found weeks before it becomes an event if the trend is being watched. The Maintenance Controller reviews the trend weekly and the DOM reviews it monthly. A shift exceeding the manufacturer's alert threshold triggers a borescope inspection, an oil analysis, and a compressor wash before the airplane is released for further training sorties.

13.3 Hot section and overhaul tracking

The engine is tracked by hours, by cycles, and by calendar simultaneously. Hot-section inspection and overhaul intervals are those published in the engine manufacturer's current service information for the specific engine model, and they are adjusted for the academy's operating environment — a high-cycle training profile with frequent starts, touch-and-go operations, and short sectors is more demanding on hot-section components than an equivalent number of hours flown in long cruise segments. Cycle counting is therefore not a formality; it is the parameter most likely to drive the engine to the shop first.

Life-limited components inside the engine are tracked individually by part and serial number with their accumulated cycles, and none is operated past its published limit. The DOM reviews remaining life against the training plan each quarter so that an engine removal is planned into the schedule rather than discovered by it.

13.4 Chip detector indications

A chip detector indication is never dismissed as fuzz, never reset to see whether it comes back in flight, and never cleared by a pilot. On an in-flight indication, the crew follows the airplane flight manual procedure and lands as soon as practicable at a suitable airport. On the ground, the airplane is grounded and the detector is removed and examined by maintenance in accordance with the engine manufacturer's instructions. The material recovered is characterized — quantity, size, magnetic or non-magnetic, and its likely origin — and the finding governs the disposition: cleaning and a defined re-inspection interval with an oil filter and oil analysis check, or engine removal. The examination, the material found, and the disposition are all recorded against the squawk.

13.5 Starter duty cycle

The starter-generator has a duty cycle limit expressed as a number of consecutive engagements with a cooling period between them and a longer cooling period after the sequence. The limits published in the approved airplane flight manual for the specific airplane govern, and they are posted at the PC-12 dispatch position. The crew records every start attempt, including unsuccessful ones, and the running count of engagements is briefed at crew change. Exceeding the duty cycle is a mandatory write-up because it can damage the starter-generator windings and brushes in ways that are invisible until the unit fails during a subsequent start.

13.6 Exceedances

WARNING

Any interstage turbine temperature or torque exceedance — including a momentary one during start, acceleration, or a power change — is a mandatory maintenance write-up filed as a safety-of-flight squawk before the crew leaves the airplane. The write-up must record the parameter exceeded, the peak value observed, the duration above limit in seconds, the phase of flight, the ambient conditions, and what the crew did in response. The airplane is grounded pending the inspection required by the engine manufacturer's exceedance table. An unreported exceedance leaves the next crew flying an engine whose condition nobody knows, and it is treated as a matter of integrity, not of technique.

Crews are told plainly that reporting an exceedance they caused will not be held against them in training. What will be held against them is not reporting it. The exceedance tables are graduated: many minor exceedances require nothing more than an inspection and a logbook entry, while a severe one requires engine removal. The crew's estimate of severity is not the deciding input — the recorded value and duration are, which is why they must be captured accurately.

13.7 Ice protection functional checks

Propeller deice and airframe pneumatic boot systems are functionally checked at the intervals in the maintenance manual and before any period of forecast icing operations. The propeller deice check verifies current draw and correct timer sequencing across the blade elements. The boot check verifies inflation and, more importantly, complete deflation and retention against the leading edge, since a boot that does

not deflate fully is worse than one that never inflated. Boots are inspected for cuts, lifted edges, and pinholes, and are treated with the manufacturer's approved conditioner only. Windshield heat, pitot and static heat, stall warning heat, and the ice detection system are checked before every flight in accordance with the flight manual.

13.8 Inertial separator

The inertial separator protects the engine from ingesting water, ice, sand, and debris. Its operation is checked before flight for full travel and correct indication, and the crew confirms it is used in accordance with the flight manual for ground operations, for operations on unpaved or contaminated surfaces, and in visible moisture at temperatures conducive to icing. Operation with the separator extended affects performance, so the crew accounts for it. A separator that is slow, incomplete, or ambiguous in its indication is a write-up, because an inertial separator that will not deploy removes a protection the crew may need at the worst possible moment.

13.9 Fuel filter bypass

The fuel filter bypass indication is checked before every flight. An indication that the filter is approaching or in bypass means unfiltered fuel is reaching, or is about to reach, the engine fuel system. It is a grounding item. The airplane is not dispatched with a bypass indication on the expectation that it will clear, and the crew does not attempt to reset it. Maintenance removes and examines the filter element, determines the nature of the contamination, checks the fuel source and the tanks, and inspects downstream components as directed by the maintenance manual before the airplane returns to service.

LIMITATION

No PC-12 is dispatched with an unresolved chip detector indication, an unresolved fuel filter bypass indication, an unexamined ITT or torque exceedance, an overdue engine condition trend monitoring data set, or an inoperative ice protection component required for the intended operation. None of these conditions is eligible for deferral, and Section 8.3 applies: a turbine airplane has no §91.213(d) relief.

14 Quality assurance & continuous improvement

14.1 The internal audit program

The Chief Inspector owns an annual audit plan that covers every element of this manual at least once per twelve-month cycle. The plan is published at the start of the year and executed by the Quality Assurance Inspector, who does not audit work they personally performed. Scheduled audits cover the inspection program and its execution, AD compliance, the squawk and deferral process, return-to-service records, parts receiving and traceability, shelf-life and calibration control, contract maintenance oversight, servicing practices, tooling and hangar housekeeping, and the electronic record system.

Unscheduled audits are triggered by an event: a recurring discrepancy reaching its third occurrence, a finding from an external inspection, a maintenance-related occurrence reported through the SMS, or a change of personnel in a position with airworthiness authority. Audit scope always includes a sample of live aircraft records, not just process documents, because a process can be correct on paper and absent in the hangar.

14.2 Findings and corrective action

TABLE 14-1 · FINDING CLASSIFICATION AND RESPONSE

CLASS	DEFINITION	RESPONSE
LEVEL 1	A finding with an immediate effect on airworthiness or a direct non-compliance with a regulation.	Affected aircraft grounded immediately. Containment the same day. Root cause and corrective action plan within seven days. Verified closure by the Chief Inspector.
LEVEL 2	A non-compliance with this manual or with approved procedures that does not immediately affect airworthiness.	Corrective action plan within fourteen days, implementation within sixty days, effectiveness check at ninety days.
OBSERVATION	A practice that complies but could be improved, or an early indicator of drift.	Logged, assigned an owner, reviewed at the next quarterly meeting. No mandatory deadline.

Every finding is tracked to verified closure. A corrective action that only re-trains the individual involved is rejected; the analysis must reach the condition that allowed the error — a procedure that was ambiguous, a tool that was unavailable, a shift turnover that lost information, a workload that made the shortcut attractive. Findings and their closures are reported monthly to the DOM and annually to the Wing Commander.

14.3 Reliability and trend review

A reliability meeting is held monthly, chaired by the DOM and attended by the Chief Inspector, the Maintenance Controller, the Quality Assurance Inspector, the Chief Instructor, and the Director of Safety. It reviews discrepancy rates by system and by airframe, component removal rates and premature removals, unscheduled maintenance hours against scheduled, dispatch reliability, deferral counts and ages, engine

trend data for the PC-12 fleet, and oil consumption trends across the fleet. Items that cross an alert level are assigned an owner and a due date in the same system used for audit findings.

14.4 Interface with the Safety Management System

Maintenance is one of the largest sources of data feeding the academy's Safety Management System. Accepted trends from Section 6.5, Level 1 audit findings, exceedance reports, and maintenance-related occurrence reports are entered into the hazard register, risk-assessed with the operational departments, and given mitigations with named owners. Several of the academy's safety performance indicators are drawn directly from maintenance data: the rate of in-flight discovered discrepancies per hundred flight hours, the proportion of squawks discovered in preflight versus in flight, the count of open deferrals by age, the recurring-discrepancy rate, and the turbine exceedance rate per hundred starts. Each indicator has an alert level and a target, and the Director of Safety reports performance against them quarterly to the Wing Commander.

Maintenance personnel use the same confidential hazard reporting channel available to cadets and IPs, and reports made through it are handled under the same just-culture policy. A mechanic who reports their own error is protected; a mechanic who conceals one is not.

14.5 Service difficulty reporting

Operators under Part 91 are not required to file service difficulty reports, but the value of the national data set depends on voluntary participation by operators who see failures early. The academy submits a service difficulty report for any failure, malfunction, or defect that could affect the continued safe operation of the type: structural cracking, control system anomalies, engine or propeller failures, fuel or ignition system defects, in-flight fire or smoke, and component failures that appear premature or systemic. The DOM approves each submission and the Records Clerk files a copy with the aircraft record.

14.6 Parts receiving and traceability

Every part entering the stores or an aircraft passes a receiving inspection by the Quality Assurance Inspector or the Logistics/Quartermaster under the Inspector's procedure. The inspection verifies the part number and serial number against the order and against the approved data for the installation, confirms the airworthiness approval documentation, checks for shipping damage and correct packaging, verifies cure dates and shelf life where applicable, and confirms the part is not on any suspected unapproved parts alert. Accepted parts are tagged and stored by part number in the controlled stores area; rejected parts go to a locked quarantine area and are never returned to stock.

WARNING

No part is installed on an academy aircraft without documentation establishing that it is eligible for that installation. Unapproved parts, parts of unknown origin, parts with missing or altered documentation, parts salvaged from an unknown source, and hardware bought from a general industrial supplier are prohibited absolutely, regardless of how identical they appear or how urgently the aircraft is needed. Any suspected unapproved part is quarantined immediately, reported to the DOM, and reported to the FAA. A mechanic who is offered a part without acceptable documentation refuses it and reports the offer.

14.7 Shelf life and tool calibration

Shelf-life-controlled materials — sealants, adhesives, composite resins, oxygen system lubricants, rubber components, batteries, and fire extinguisher and oxygen cylinder charges — are labeled with their expiry on receipt and stored under the conditions the manufacturer specifies. Stock is rotated oldest first, and the Logistics/Quartermaster reviews expiry monthly. Expired material is disposed of, not used up quickly, and disposal is recorded.

Precision measuring and test equipment — torque wrenches, pressure gauges, multimeters, altimeter and transponder test sets, borescopes, and calibrated weighing equipment — is on a calibration recall list managed by the Chief Inspector, with intervals set by the manufacturer or by usage. Calibration is traceable to national standards, and each item carries a legible calibration label with its due date. Equipment past its due date is removed from service and quarantined. When a tool is found out of calibration, the Chief Inspector determines what work was performed with it since its last valid calibration and evaluates whether any aircraft must be re-inspected — a finding of that kind can reach back across weeks of work, which is the reason the recall list is treated as an airworthiness control and not as housekeeping.

14.8 Manual revision

This manual is reviewed annually by the DOM and the Chief Inspector and is revised whenever a regulation changes, a fleet type is added or removed, an audit finding identifies a gap, or an occurrence shows that a procedure did not produce the intended result. Revisions are approved by the Wing Commander, given a revision number and effective date, and distributed electronically; the current revision is always the one published here. Superseded revisions are retained by the Records Clerk. Personnel acknowledge each revision, and the acknowledgement is recorded in the individual's training file. Related controlled documents are the General Operations Manual, the Flight Standards Manual, and the Safety Management System Manual; the complete set is indexed at /manuals.