Chapter 03: Maintenance Operations

02. Pre-Maintenance Aircraft Inspection

Conduct thorough pre-maintenance inspections to identify all maintenance requirements and establish accurate work scope.

Purpose

Establish a systematic approach to pre-maintenance aircraft inspections that identifies all maintenance requirements, documents aircraft condition, and ensures accurate work scope determination before maintenance activities begin. This process protects both client interests and maintenance facility operations by establishing clear baseline conditions.

Roles and Responsibilities

Client Service Representative:

- Manage client communications and service requests
- Process documentation and billing
- Obtain client authorizations and approvals
- Coordinate scheduling and aircraft availability
- Maintain professional client relationships

Process Steps

Pre-Inspection Preparation

- **Review aircraft maintenance records** - Examine logbooks, previous work orders, and maintenance history to understand aircraft condition and recurring issues
- **Verify aircraft configuration** - Confirm aircraft registration, serial numbers, installed equipment, and modifications against official records
- **Check regulatory compliance status** - Review airworthiness directives, service bulletins, and inspection due dates for current compliance status
- **Prepare inspection documentation** - Set up inspection forms, camera equipment, and measurement tools for systematic documentation process

External Aircraft Inspection

- **Inspect fuselage structure** - Examine skin, frames, and structural components for cracks, corrosion, damage, or wear patterns requiring maintenance attention
- **Check flight control surfaces** - Verify control surface attachment, hinge condition, balance, and operational limits within manufacturer specifications
- **Examine landing gear system** - Inspect struts, wheels, brakes, tires, and hydraulic components for wear, leaks, or operational deficiencies
- **Assess engine and propeller condition** - Check engine mounts, cowling, propeller, and associated systems for security, damage, or maintenance needs

Internal Systems Inspection

- **Review avionics and electrical systems** - Test operation of navigation, communication, and electrical systems while documenting any malfunctions or discrepancies
- **Check cabin and cockpit condition** - Inspect interior components, seats, controls, and safety equipment for airworthiness and operational requirements
- **Examine engine compartment** - Inspect engine accessories, hoses, wiring, and fluid levels while identifying any leaks or component deterioration
- **Test flight controls and systems** - Verify proper operation of all flight controls, trim systems, and pilot-controllable systems

Documentation and Assessment

- **Document all findings** - Record detailed descriptions, measurements, and photographs of all discrepancies and maintenance items identified during inspection
- **Categorize maintenance requirements** - Classify findings as mandatory, recommended, or optional based on regulatory requirements and safety considerations
- **Research maintenance procedures** - Review manufacturer maintenance manuals and regulatory guidance for proper repair and inspection procedures
- **Estimate maintenance requirements** - Calculate labor hours, parts requirements, and completion timeline for all identified maintenance items

Client Communication and Authorization

- **Prepare inspection report** - Compile detailed findings report with photographs, cost estimates, and recommended maintenance priorities for client review
- **Present findings to client** - Explain inspection results, regulatory requirements, and maintenance options with clear cost and timeline information
- **Obtain maintenance authorization** - Secure written client approval for all maintenance work before

proceeding with repairs or additional inspections

- **Update work order documentation** - Revise original work scope and cost estimates based on inspection findings and client authorization decisions

Process Mapping

Flowchart to show sequential steps

Tools and Resources

- Aircraft maintenance records and logbooks
- Pre-inspection checklist forms and documentation templates
- Digital camera and measurement tools for documentation
- Manufacturer maintenance manuals and parts catalogs
- FAA regulations database and airworthiness directive listings
- Inspection mirrors, flashlights, and access equipment
- Cost estimation software and labor time guides
- Client communication forms and authorization templates

Success Metrics

- **Completion Time:** Pre-maintenance inspection completed within 8 hours of aircraft arrival.
- **Quality Standard:** 100% documentation of all discrepancies requiring maintenance attention.
- **Safety Standard:** Zero missed airworthiness items or regulatory compliance requirements.
- **Client Satisfaction:** 90% client approval rating for inspection thoroughness and communication clarity.

Common Issues and Solutions

- **Issue:** Discovering additional maintenance requirements not identified in initial work scope
- **Solution:** Implement systematic inspection procedures, maintain current technical references, and establish clear client communication protocols for scope changes

Issue: Incomplete or inaccurate aircraft maintenance records affecting baseline assessment

Solution: Conduct more detailed physical inspection, contact previous maintenance providers for records, and document all assumptions in inspection report

Issue: Client resistance to additional maintenance items discovered during inspection

Solution: Clearly explain regulatory requirements, safety implications, and provide detailed cost-benefit analysis for recommended maintenance items

Safety Considerations

⚠️ **WARNING:** Never skip inspection of critical flight systems or structural components even when time constraints exist

⚡ **CAUTION:** Ensure all inspection findings are properly documented before moving aircraft or beginning maintenance work

ℹ️ **NOTE:** All inspection discrepancies must be resolved or properly deferred before aircraft return to service

✅ **BEST PRACTICE:** Use standardized inspection checklists and documentation procedures to ensure consistent inspection quality

Regulatory References

- **14 CFR Part 43.15** - Additional Performance Rules for Inspections
- **14 CFR Part 91.409** - Inspections
- **14 CFR Part 91.417** - Maintenance Records
- **AC 43-9C** - Maintenance Records
- **AC 43.13-1B** - Acceptable Methods, Techniques, and Practices
- **AC 20-105B** - Reciprocating Engine Power-Loss Accident Prevention