

CHAPTER 37 MONITOR CONTINUING ANALYSIS AND SURVEILLANCE PROGRAM/REVISION

Section 1 Background

1. PTRS ACTIVITY CODES

A. *Maintenance*: 3635

B. *Avionics*: 5635

3. OBJECTIVE. This chapter provides guidance for monitoring a continuing analysis/surveillance program and for evaluating the overall effectiveness of the continuous airworthiness maintenance program.

5. GENERAL

A. Some operators, with approved reliability programs, use the reliability program to fulfill the monitoring mechanical performance functions requirement of its continuing analysis and surveillance program. Since both reliability programs and continuing analysis and surveillance programs require data collection, data analysis, and corrective action requirements, a duplication of operational data would occur.

B. Not all the elements of Advisory Circular 120-17, Maintenance Control by Reliability Methods, as amended, are required to be contained in a continuing analysis and surveillance program for monitoring mechanical performance. Advisory Circular 120-17, as amended, does not provide for the audit function of continuing analysis and surveillance programs.

7. INITIATION AND PLANNING

A. *Initiation.* This task is scheduled as part of the work program. Additional inspections are initiated by national, regional, or district office special requirements. When given this assignment, the inspector must review current Federal Aviation Regulations (FAR) requirements and FAA policy.

B. *Planning*

(1) *Program requirements*

(a) The program must contain a system that determines the effectiveness of the maintenance and inspection programs, and provides for timely corrective action of any deficiencies in the maintenance/inspection programs. This system must be identified in a chapter of the operator's maintenance manual and must reference FAR §§ 121.373 and/or 135.431.

(b) Any portions of the program not contained in this chapter of the manual must be referenced to their exact location. For example, an approved reliability program must be referenced in the Program if it is used to fulfill the mechanical monitoring function of the program.

(2) *Operator size.* The complexity and sophistication of the Program should be relative to the operator's operation. A small operator should not be expected to have a program suitable for a large operator; however, all programs must have, as a minimum, monitoring mechanical performance and audit functions. Procedures for administering these two functions must be identified in the operator's manual.

(3) *Monitor mechanical performance function.* This function must provide for collecting and analyzing operational data. The intent here is to identify deficiencies that require corrective action. This monitoring is done through emergency response, day-to-day monitoring, and long-term monitoring.

(a) *Emergency responding:* Emergency responding includes identifying emergency/critical situations, determining causes, and formulating a plan to ensure that similar conditions do not exist in like equipment. Typical examples of emergency/critical situations include:

- In-flight engine separations
- In-flight propeller separations

- Uncontained engine failures
- Critical structural failures
- Any life-limited part failure

(b) *Day-to-day monitoring.* Normally, large operators conduct daily meetings to discuss morning launch delays and activities of the previous day. Smaller operators conduct these meetings at less frequent intervals. Items typically discussed include:

- Daily mechanical problems of each aircraft
- Non-availability of spare parts
- Inadequate manpower to perform maintenance
- Deferred maintenance items -- excessive numbers and time
- Safety related failures
- Recurring maintenance problems
- Excessive unscheduled maintenance
- Maintenance delays/cancellations
- Scheduled inspection results, including sufficient time to complete the check, unusual/critical findings, recurring problems, and parts/equipment/manpower availability

(c) *Long-term monitoring.* This system should include charting or some appropriate means of reporting and accounting operational data at specified intervals to reveal trend-related information. Typical examples of operational data used by the operator to monitor mechanical performance are:

- Pilot reports compiled by Air Transportation Association (ATA) code

- Inspection findings compiled by ATA code
- Failure rates compiled by ATA code
- Tear-down reports
- Premature removal rates (includes engines)
- Engine shut-down rates
- Confirmed failure rates
- Deferred Minimum Equipment List (MEL) items
- Mechanical Interruption Summaries (MIS)
- Mechanical Reliability Reports (MRR)

(4) *Audit functions*

(a) Auditing is normally on-the-scene observation and should be a scheduled, on-going activity encompassing periodic audits of contract agencies. The audit also addresses adequacy of equipment and facilities, storage and protection of parts, competency of mechanics, and housekeeping.

(b) To be effective, audits should be separate from the maintenance organization. If audits are assigned to organizational units with other duties, the audit should be accomplished as an independent activity. Under no conditions may an organizational unit perform an audit on itself. Typical audit functions ensure that:

- All publications and work forms are current and readily available to the user
- Maintenance is performed according to the methods, standards and techniques specified in the operator's manuals
- Maintenance forms are screened for completeness, proper entries, and Required Inspection Item identification
- Major repairs/alterations are properly classified and accomplished with approved data

- Records of all applicable Airworthiness Directives contain current status and method of compliance
 - Airworthiness releases are executed by designated persons and according to procedures specified in the operator's manuals
 - Records reveal current status of life-limited parts
 - The training program syllabus is being followed
 - Carryover items and deferred maintenance are properly handled
 - Vendors are properly authorized, qualified, staffed, and equipped to do the contractor function according to the operator's manual
- (5) *Use of contractors.* When the operator contracts with another operator and/or repair station for maintenance support, the operator is still responsible for continuing analysis and surveillance requirements. The responsibility for administering or controlling a continuing analysis and surveillance program can never be contracted out. However, contract organizations may be used to collect operational data, make analyses and recommendations, perform audits, and report information to be used by the operator in identifying deficiencies and implementing corrective action.
- (6) *Scheduling inspection.* Normally, this inspection will be coordinated verbally with responsible persons of the operator. If responsible persons are not available on the agreed-upon date, reschedule the inspection with the operator and notify the operator in writing to confirm the date.

Section 2 Procedures

1. PREREQUISITES AND COORDINATION REQUIREMENTS

A. Prerequisites

- Knowledge of regulatory requirements of FAR Parts 121 and 135
- Successful completion of Airworthiness Inspector's Indoctrination Course for General Aviation and Air Carrier Inspections, or previous equivalent
- Previous experience working with an operator required to have a continuing analysis and surveillance program

B. *Coordination.* This task requires coordination between the principal inspectors assigned to the operator. Additional coordination may be required with local, regional and headquarters personnel, depending on the severity of the noncompliance.

3. REFERENCES, FORMS, AND JOB AIDS

A. References

- Advisory Circular 120-16, Continuous Airworthiness Maintenance Program, as amended
- Advisory Circular 120-17, Maintenance Control By Reliability Methods, as amended
- Operator's Maintenance Procedures Manual

B. Forms. None.

C. Job Aids. None.

5. PROCEDURES

A. *Review Office Files.* Review the historical data of the program to include the following:

- The PTRS history of past inspections

- The Enforcement Investigative System (EIS)
- The previous six months' Mechanical Reliability Reports (MRR's)
- Mechanical Interruption Summaries (MIS's)
- Engine Utilization Reports (EIR's)
- Any other operational data that might indicate negative trends in the maintenance/inspection program
- Deferred maintenance (Minimum Equipment List) items and length of time items remain deferred
- Repeat pilot reports

C. *Review the Operator's Manual.* Before making the on-site inspection, obtain the operator's maintenance procedures manual and review the continuing analysis and surveillance program. It is vital that the inspector obtain precise knowledge of the operator's programs, concepts, and how the program is administered. While reviewing the manual to ensure that it complies with the Federal Aviation Regulations, and before making the inspection, note any unclear areas, obvious omissions, or apparent discrepancies.

B. *Collect Items To Be Used During Inspection.* Note and collect the following:

(1) Samples of any negative trends in previous six month's Mechanical Reliability Reports, Mechanical Interruption Summaries, and Engine Utilization Reports

(2) Samples of negative trends in operational data that has been identified by the operator in previous reports

(3) Reports of all emergency/critical situations during the previous twelve months

(4) Samples of records from the day-to-day monitoring meetings in which corrective actions were deemed necessary

(5) Negative trends in the maintenance/inspection program noted during routine surveillance that have not been detected by the continuing analysis/surveillance program. Examples of situations indicating negative trends include increases in the following:

- Aircraft delays
- Premature removal rates
- The number of engine shutdown rates
- Number of short term escalations

(1) Review the operator's program as described in the manual. Ensure that it contains policies and procedures for determining the effectiveness of the maintenance/inspection program and for corrective action of any deficiencies in those programs as required by FAR §§ 121.373 and 135.431.

(2) Ensure that the manual contains procedures for administering the continuing analysis and surveillance program that are clear and easy to understand.

(3) Ensure that the operator's manual describes a systematic method of reviewing operational data. It should determine the effectiveness of the maintenance/inspection program through:

- Emergency responding
- Day-to-day monitoring
- Long-term monitoring

(a) *Emergency responding:* The manual must include procedures for responding to critical and/or emergency safety-related situations. Review the manual procedures to ensure:

- Critical/emergency situations are defined
- Procedures exist for the notification/coordination process

- Procedures exist for determining if similar situations exist on other aircraft
- Procedures are used to implement corrective action
- Procedures define how the FAA is notified

(b) *Day-to-day monitoring.* Ensure that the manual contains procedures for conducting periodic meetings with required personnel to discuss mechanical performance and identify the need for corrective action. Procedures must include:

- What items are discussed
- When meetings are conducted
- Who attends meetings
- How records of these meetings are forwarded to the FAA

(c) *Long-term monitoring: data collection.* Determine how the operator is monitoring the mechanical performance function of the program. This monitoring should include, at a minimum:

- What operational data the operator is using
- What forms are used to collect the data
- Who is responsible for compiling the data
- When and how often the data is collected

(d) *Long-term monitoring: data analysis.*

Ensure that the manual has procedures for analyzing operational data. The procedures must include:

- When the analysis is to be performed

- Who is responsible for performing the initial analysis
- What conditions, based on performance standards, warrant corrective action
- Who is responsible for performing further analysis and making a corrective action recommendation

(5) Ensure that the manual has procedures for taking corrective action based on the data analysis. The procedures must describe:

- Who has responsibility for implementing corrective action
- When the corrective action will be implemented
- How the corrective action will be phased into the maintenance program

NOTE: Some operators fulfill this long-term monitoring function through their approved reliability programs.

(6) Ensure that the operator's manual contains audit functions. Review the manual.

(a) The procedures must provide a continuous audit of the total maintenance program, including contract agencies. The procedures must state:

- Who is responsible for performing audits (normally, an independent agency that is assigned to the quality assurance/inspection department)
- What is being audited (e.g. manuals, maintenance, record entries, Required Inspection Items (RII), training, airworthiness releases, deferred maintenance, vendors, etc.)
- When the audits are performed

- How the audits are documented
- How records are retained

(b) Procedures for analyzing audit functions must include the following:

- Analyzing each audit to identify deficiencies
- Initiating corrective action for each deficiency
- Providing for on-the-spot corrective action, if appropriate
- Providing for further analysis to determine system breakdown
- Establishing qualifications of persons performing analysis
- Recording audit findings and subsequent actions

(c) Procedures must contain corrective action, to include:

- Timely implementation of corrective action from the data analysis
- Follow-up to determine effectiveness of the corrective action

E. Document Findings of Review Prior to On-Site Inspection. Document preliminary findings found during the office and manual review, and discuss them with the principal inspector/supervisor. Along with the principal inspector/supervisor, indicate those inspection findings that must be brought to the attention of the operator during the initial meeting. These findings will be used in determining the overall effectiveness of the program.

F. Schedule Inspection. Schedule inspection with the operator. Coordinate the inspection with the operator to determine when the operator's personnel will be available

and agree upon a time for the inspection. Arrange to attend a periodic meeting.

G. Meet With the Operator. Contact the person who has overall responsibility for the program and discuss:

- The nature and scope of the inspection
- Negative trends discovered during manual and office review
- Organizational elements responsible for administering the program, including identifying personnel

H. Verify Currency of Operator's Manual. Ensure that the organizational person responsible for the continuing analysis and surveillance program has the current manuals. This can be done by comparing the effective dates or revision dates of the manual master copy held by the operator with the manual held by the responsible person.

I. Determine if Staffing Equals That Described in the Operator's Manual. Compare the current organization to the organization described in the manual. Document any differences in staffing. These differences will be used in the final analysis in determining the effectiveness of the continuing analysis and surveillance program.

J. Ensure That Manual is Readily Available to Personnel. Determine whether each organizational element responsible for administering the program has a current copy of the manual available.

K. Inspect Operator System To Monitor Mechanical Performance. During the inspection, document and photocopy any instances in which the operator did not follow the procedures identified in the manual by inspecting the following areas:

(1) *Emergency responding.* Using the previous year's reports of emergency actions gathered during the office review, determine whether:

- Manual procedures were followed to ensure that similar situations did or did not exist on other aircraft

- Fault analysis was accomplished for each situation
- Any corrective action established was implemented and effective

(2) *Day-to-day monitoring*

(a) Establish that periodic meetings are occurring as defined in the manual.

(b) Attend a periodic meeting to determine if daily mechanical problems are being discussed and if the appropriate personnel are attending.

(c) Using day-to-day monitoring records collected during office review, determine, when the need for corrective action was recognized, whether:

- The problem was assigned to appropriate personnel
- The plan for corrective action was established, implemented and effective

(3) *Long-term monitoring*

(a) *Data collection:* Compare the manual procedures with the actual data collection. Ensure that the following is being accomplished according to the manual:

- All operational data was collected and was entered on the appropriate forms
- The appropriate persons compiled the data
- The data was collected at the specified times

(b) *Data analysis:* Determine if data analysis is being performed in accordance with manual procedures by comparing the manual procedures to actual performance. Ensure that:

- Operational data was analyzed to identify items exceeding performance standards, indicating negative trends
- These items were further analyzed to identify cause by using the sample of negative trends reported by the operator and collected during the planning of the inspection
- Initial and further analysis was performed by trained, competent, qualified personnel
- Audit functions are accomplished when analysis has identified the need
- The need for corrective action was determined

(c) *Corrective action:* Use the same sample of the negative trends used in the data analysis to ensure that a corrective action plan was established and implemented for those items requiring corrective action. Continue to follow those items through the corrective action process.

- Determine if the plan required changes to the maintenance/inspection program
- Ensure that these changes were implemented
- Review operational data to ensure that the corrective action was effective in reversing the negative trend

(d) Document all findings indicating that manual procedures were not followed. These findings will be used in determining the overall effectiveness of the continuing analysis and surveillance program

L. Inspect the Operator System to Audit the Maintenance Program. Document and photocopy any instances in which the operator did not follow the procedures identified in the manual. Contact the responsible person to determine what audits were accomplished in the past 12 months.

(1) Inspect audit functions by accomplishing the following:

- Sample a cross-section of audit requirements identified in the manual and have the operator provide records of audit completion
- Review the audit completion records to determine scope and detail of inspection
- Verify results of audit by performing spot-check of audited facility
- Verify that audits were performed within specified time periods
- Determine whether persons who performed the audits have experience and expertise in the areas audited
- Determine whether audit functions triggered by analysis are accomplished
- Discuss any other areas of concern found during surveillance that was not noted through the audit system

(2) *Analyze audit findings.* Determine if the operator has performed analysis of audits. Using samples collected from audit records provided by the operator, determine the following:

- Analysis of each audit was accomplished to identify deficiencies
- On-the-spot and system corrective actions were implemented to correct deficiencies
- Personnel performing audit had necessary experience and expertise

(3) *Corrective action.* Using the same samples:

- Determine if the operator has implemented corrective action

- Perform an on-site inspection to ensure that the corrective action was implemented and timely
- Determine the effectiveness of corrective action by ensuring that similar deficiencies no longer exist

(4) Document all findings indicating that manual procedures were not followed. These findings will be used in determining the overall effectiveness of the program.

M. Follow Up Negative Trends Identified During Office and Manual Review

- (1) Contact the person responsible for the negative trend.
- (2) Determine whether the trend was significant.
- (3) Determine why the trend was not identified by the program.
- (4) Ensure that corrective action is initiated.
- (5) Document all findings.

N. Determine Effectiveness of the Program. Combine all inspection findings from the following to determine program effectiveness, including:

- The office and manual review
- On-site inspection
- Inspector-identified trends

O. Coordination. After assessing the program and before debriefing the operator, consult with the appropriate FAA supervisory personnel to determine which (if any) findings require official notification.

P. Debrief Operator. In the operator's debriefing:

- Discuss results of the inspection

- Discuss all discrepancies discovered during the inspection
- Discuss possible corrective action
- Inform the operator that official written notification of findings will follow
- Inform the operator that a plan for timely completing corrective action must be submitted

NOTE: Agree with the operator upon time limits for the corrective action plan during the debriefing. Negotiations over time limits can be done later if mitigating circumstances arise.

7. TASK OUTCOMES

A. *File PTRS Transmittal Form*

B. Successful completion of this task will result in a formal letter to the operator confirming the inspection findings.

C. *Document Task.* File all supporting paperwork in the operator's office file.

9. FUTURE ACTIVITIES. At the end of the time limit for corrective action, schedule a six month follow-up inspection in the areas of deficiency to determine the effectiveness of the operator's corrective action.

