United Kingdom Overseas Territories Aviation Circular

OTAC 39-14

Reliability Monitoring Programmes

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GENERAL

Overseas Territories Aviation Circulars are issued to provide advice, guidance and information on standards, practices and procedures necessary to support Overseas Territory Aviation Requirements. They are not in themselves law but may amplify a provision of the Air Navigation (Overseas Territories) Order or provide practical guidance on meeting a requirement contained in the Overseas Territories Aviation Requirements.

PURPOSE

This Overseas Territories Aviation Circular provides information and guidance on the conditioned monitored and reliability monitoring in accordance with OTAR Part 39.65 requirements when required for an aircraft registered in an OTAR Territory and granted a Certificate of Airworthiness.

RELATED REQUIREMENTS

This Circular relates to OTAR Part 39 Subpart C.

CHANGE INFORMATION

First issue.

ENQUIRIES

Enquiries regarding the content of this Circular should be addressed to Air Safety Support International at the address on the ASSI website www.airsafety.aero or to the appropriate Overseas Territory Aviation Authority.

CONTENTS

ABBREVIATIONS

APU: Auxiliary Power Unit

EDTO: Extended Diversion Time Over Water

IFSD: In Flight Shut Downs

Lo Viz: Low Visibility

MCM: Maintenance Control Manual

MPD: Maintenance Planning Document

MRB: Maintenance Review Board

MSG-3: Maintenance Steering Group Version 3

OEM: Original Equipment Manufacturer

PIREPs: Pilot Reports

GLOSSARY OF TERMS

Reliability

The probability that an item will perform a required function, under specified conditions, without failure, for a specified period (calendar, hours, or cycles).

Reliability Programme

The reliability programme of aircraft in operation and maintenance is a combination of statistic monitoring and recording of the events associated with the airworthiness of an aircraft. The results obtained by monitoring reliability in operation serve as a basis for supplementing or modifying the aircraft maintenance programme; such changes would indicate the malfunction of components or systems manifesting lacks and the need for early control, or replacement during utilization.

Reliability Programme Document

The document that is prepared by the operator which explains how they will monitor reliability, use the information to optimise their maintenance programmes and record and report the information.

Reliability Report

A periodic document or set of data produced by the operator that shows the ongoing reliability of the aircraft, engines, systems, and components.

1. Introduction

Aviation legislation in the Overseas Territories (OTs) reflects the ICAO Standards and requires that certain aircraft ‘s maintenance programmes are supported by reliability monitoring programmes

This OTAC provides general advice and guidance to OTAAs and operators of aircraft on information on when a reliability monitoring programme is required and the information it should contain. It is a means but not the only means to produce a reliability monitoring programme. Operators should consult with their OTAA in the interpretation of the requirements for a reliability monitoring programme.

This OTAC also provides guidance for developing and maintaining a reliability programme as part of an Airworthiness Maintenance Programme (AMP).

The OTAC includes information for:

- Collecting and analysing operational data,
- Developing operational performance standards,
- Identifying and correcting deficiencies,
- A reliability programme’s data display and reporting function,
- Maintenance Schedule task and interval adjustments,
- Reliability programme management and administration, and
- Reliability Programmes for Small Fleets

2. Applicability and Purpose

2.1 The purpose of a Reliability Programme is to ensure that the aircraft maintenance programme tasks are effective and their periodicity is adequate.

ICAO Annex 6, Parts 1 and 3 requires a Reliability Programme when:

(a) the aircraft Maintenance Programme is based upon MSG-3 logic;

(b) the aircraft Maintenance Programme includes condition monitored components;

(c) aircraft Maintenance Programme does not include overhaul time periods for all significant system components, the failure of which could hazard the aircraft safety; or

(d) when specified by the manufacturer’s MPD or MRB Report.

2.2 The purpose of a reliability programme is to ensure that the aircraft maintenance programme tasks are effective, and their recurrence at regular intervals is adequate. The reliability programme therefore may give rise to the optimization of a maintenance task interval, as well as the addition or deletion of a maintenance task. In this respect, the reliability programme provides an appropriate means of monitoring the effectiveness of the maintenance programme.

2.3 Reliability programmes are designed to supplement the operator's overall programme for maintaining aircraft in a continuous state of airworthiness.

3. The Operators Reliability Programme

3.1. The main elements of an operator's reliability programme are typically:

- A data collection system,
- A performance standards system,
- Analysis and recommendation,
- Internal approval and implementation, and
- A reporting and display format.

3.2 The Operator's Reliability Programme Manual

The reliability programme manual could be provided as a section in the MCM or may be a separate document that is referenced within the MCM.

The operator should ensure their standards for evaluating and determining time limitations contain the following:

(a) A general description of the reliability programme, including definitions of (or reference to) significant terms used in the reliability programme.

Note: They may not use the reliability programme as a means to change the meaning or intent of regulatory-based definitions, restrictions, limitations, or reporting requirements. When defining terms, they should be as specific as possible and when applicable, provide qualifying criteria to avoid ambiguity and confusion when executing programme requirements.

(b) The application of the reliability programme by aircraft fleet type and model.

(c) Procedures and standards for data collection and ensuring applicability/data quality.

(d) The organizational responsibilities, training, and experience requirements.

(e) Duties and responsibilities for personnel who perform programme requirements. This includes personnel such as those who monitor performance standards or alert/event levels, analyse operational data, and board members or personnel who perform decision-making functions.

(f) The procedures for monitoring and revising the performance standards.

(g) Data analysis methods.

(h) The corrective action recommendation process, including approval and implementation.

(i) Reports used or generated, and the frequency.

(j) Standards and procedures for adjusting time limitations.

(k) Description or references to forms unique to the reliability programme.

(l) Management and administration procedures, including reliability programme revision process.

(m) Requirements or references to self-audits and other monitoring procedures for the performance and effectiveness of the reliability programme.

(n) Description or organizational chart of reliability programme organizational authority and delegation. The administration of a reliability programme generally requires a board or other organizational body within an operator's

maintenance organisation. This board should be comprised of experienced and competent personnel with decision-making authority to approve changes to the operator's maintenance schedule.

3.3 Identifying Participants

The operator should identify in their manual those participants who have authority and responsibility for the reliability programme, including:

(a) The Nominated postholder for Airworthiness or equivalent who has overall authority and responsibility for the entire programme.

(b) The person who has direct authority and responsibility for the reliability programme process.

(c) The individual positions in the operator's organisation and their role within the reliability programme, including responsibilities and authority.

3.4 Reliability Personnel Training/Technical Competency

(a) The operator should determine their own technical standards and training requirements for persons whose role is to collect, analyse, and compile reliability data or reports. The desired competency and capability standards should be defined and be based on the level of complexity of the operational and scheduled maintenance data they collect (see Table 1, Competency Training).

(b) The operator may adjust the content, frequency, and method of training provided to individuals depending on an evaluation of the individual's roles and responsibilities, previous training, hands-on maintenance experience, and/or demonstration of aptitude, and the results being achieved.

(c) Reliability programme participants with approval authority should fully understand their roles and responsibilities relative to the reliability programme.

Table 1. Competency Training

Subject Training	**Reliability Personnel Knowledge Standards**
OTAR 121/135 operation specifications (Op Specs); OTAR part 39	Familiarization and awareness
Systems analysis training	General training in quality standards and statistical analysis methods
Reliability data training	Experience or training in conducting and reporting analysis results for operational data and other scheduled maintenance findings
MSG-3	Understanding of applicable MSG methodology used in developing the maintenance schedule
Risk assessment training	The ability to assess risk as it relates to a situation, failure, or hazard

Root cause analysis training, including human factors	Method of problem solving that identifies the root causes of faults, failures, deficiencies, or hazards
Failure Mode and Effects Analysis (FMEA) training	Method of analysis that identifies the failure modes and failure effects related to specific faults or failures
Technical training	Aircraft-specific (make, model, and series

4. Reliability Programme Submission and Subsequent Use

Prior to use, the operator must submit the initial reliability programme manual and each subsequent revision to the OTAA for review. The operator may use the programme after the OTAA airworthiness inspector has notified them that the programme is acceptable and has issued a letter authorising its use.

5. Continuous Evaluation

As part of an effective continuing analysis and surveillance system the operator should continually monitor the performance and effectiveness of the reliability programme and make revisions as necessary.

They should also conduct periodic, documented reviews to determine that the performance standards are realistic and are effective in identifying deficiencies.

6. Data Collection System

6.1 Identification of Data Sources

An operator should identify data sources from all these four general categories of their fleet, these should include:

- Systems,
- Components/line replaceable units (LRU),
- Structures, and
- Engines/APUs.

The reliability programme manual should explain the data sources.

6.2 Identification of Data Types

The data collection system should include the identification of data types. Table 2 lists typical types of operational data; however, all these data types do not need to be included in the reliability programme, nor does this list prohibit the use of other types of information.

Table 2

Data Type	In Service Data	Routine Task Findings
Aircraft Technical log (failures/defects)	X	X
Flight Logs (PIREPS)	X	
Engine in-flight shut down (IFSD)	X	
Operational interruptions (delays, cancellations, diversions, etc.)	X	
Unscheduled component removals	X	
Component maintenance findings	X	X
Sampling Inspections	X	X
Special Inspections	X	X
Maintenance deferred in accordance with the MEL	X	X
Chronic systems	X	X
Unscheduled Maintenance		X
Health Monitoring (a) Aircraft (b) Engine	X	X
Materials Usage	X	X
EDTO Event Reports	X	
Lo Viz Ops Events (Cat II/Cat III)	X	
RVSM	X	
Scheduled Maintenance Findings	X	X
Accidents or Incidents	X	X
Unscheduled Engine Removal	X	X
Service Difficulty Reports and MORs	X	X

7. Data Quality

7.1 General

Data sources and associated data types form the foundation of any reliability programme.

Data can be considered of sufficient quality when it is accurate, free from substantive recording errors, and comprehensive enough in both scope and detail to facilitate its intended function in operations, analysis, and decision making.

7.2 Ensuring Validity and Accuracy of Data

The operator should develop a process to validate the accuracy of the data used in support of the reliability programme. A typical data accuracy/data quality process includes:

- Adopting comprehensive data and maintenance recording standards and instructions;
- Forms and instructions designed to achieve compliance with the data standards;
- Performing and documenting data audits to detect deficiencies and correct data irregularities;
- Establishing a documented method for providing feedback to organizational elements demonstrating deviations from the data standards; and
- A common coding convention or system used to correlate mechanical irregularities in aircraft systems with defects found during routine maintenance tasks, shop teardown reports and other relevant data.

Note: While an electronic means of collecting, storing, retrieving, and analysing data is not required by rule, limitations in these areas may restrict or preclude the operator from exercising the requisite responsibilities necessary to implement and maintain an effective reliability programme.

8. Performance Standards System

8.1 Identification of Performance Standards

A performance standard is expressed numerically, as a number, rate, ratio, or percentage. It may be calculated by the number of events occurring in a specified operating period expressed in flight cycles, flight-hours, operating hours, or calendar-time. Performance standards are used to identify an acceptable measure of reliability in terms of system or component failures, pilot reported mechanical irregularities, operational delays and cancellations, scheduled maintenance findings, or some other event which serves as the basis for the standard. When used to develop acceptable performance, control limits or alert values should be based on generally accepted statistical methods, such as standard deviation or the Poisson distribution.

Other programs may apply an average or baseline method. Additionally, the programme should include procedures for periodic review and adjustment of the standards, as well as detailed procedures for monitoring new fleet types until sufficient operating experience is available for computing a performance standard. Acceptable performance standards should be adjustable based on operational experience, as well as the effects of fleet age, operational, seasonal, and environmental considerations. Performance standards should be associated with the specific aircraft system as related to the data types being measured.

8.2 Techniques for Determining Reliability Trends

An operator may elect to use one or a combination of the techniques listed in Table 3, Techniques for Determining Deviation from Performance Standards, or any another acceptable method that identifies when the operator-defined acceptable performance level is not achieved.

Regardless of the method an operator chooses, it should be proactive and should be capable of identifying emerging and current operational problems that the carrier may need to correct. The method chosen should not be so liberal that abnormal deviations from an acceptable standard would not be identified as a problem or as an underlying deficiency. Nor should the method be so conservative that it would result in excessive data “noise” from which too many deviations from the standard are identified. An effective method will result in relevant and meaningful data from which potential, emerging, and real-time deficiencies can be identified, analysed, and addressed.

Table 3

Technique	Method	Inputs Required for Analysis	Action Driver	Reliability
Alert-Based	Identifies deviations from a defined standard based on previous performance. The alert level is set so an alert is triggered by an increase in failure rate or scheduled findings to a degree beyond normal variation.	Statistical characterization of historical failure rates or scheduled maintenance findings is required to determine the appropriate alert threshold for the system under consideration.	Investigation required when the performance falls outside normal variation.	Identification of data type(s); definition of the method used to calculate the alert level.
Trend Monitoring	Graph or table that tracks current performance to identify out-of-limit conditions or trends of deterioration.	Understanding of the measurement units that have a relationship to system failures (e.g., hours vs. cycles). Aircraft system data is typically supplemented by data from component removals and confirmed failures.	Investigation required when a metric falls outside performance limits or is predicted to do so in the near term based on the current trend.	Identification of data types; timeframes selected for monitoring performance (for example, monthly, quarterly, or yearly averages). Definition of units of measurement and demonstration so they are appropriate to the type and frequency of events being recorded.

Event-Based	An event-based programme monitors and develops recommendations in response to specific operational events.	The number and range of inputs must be sufficient to allow data analysis that results in meaningful conclusions. Much of the information that is compiled to assist in the day-to-day operation of the operator's maintenance programme may be effectively used as a basis for this type of continuous mechanical performance analysis.	Investigation of: the lowest performing items, AND any item with a significant change in performance rank, AND events of significant operational or safety consequences.	Identification of data types; definition of performance level and rate of change that would drive investigation.
Index-Based	Multiple data types combined to produce an index ranking of performance (e.g., pilot reports, delays/ cancellations, or routine task findings).	Knowledge of the parameters and their interactions that can be used to indicate operational reliability drivers.	Investigation of the lowest performing items, AND of any item with a significant change in performance index trend.	Identification of data types; definition of the index calculation method; definition of performance level and rate of change that would drive investigation; individual data types may be weighted to reflect operator's performance goals and philosophy.

8.2.1 **Alert-Based Programs**

The purpose of an alert level is to identify significant deviations from a previously acceptable standard of performance. The level should not be set so high that a major increase in the failure rate does not produce an alert, nor so low that the normal distribution of failures results in excessive alerts.

The actual alert level will normally depend on the distribution or "scatter" observed in the failure rates of the system under review. The operator should recognize that alert levels are not minimum acceptable airworthiness levels, but rather are a means of readily identifying increases in failure rates that fall outside the parameters of what is considered normal performance variation. In every case, further investigation is warranted but may or may not result in identification of a problem or deficiency. There are several recognized methods of calculating alert levels, any one of which may be used provided that the method chosen is fully defined in the operator's programme document.

8.2.2 Trend Monitoring Programs

When data is prepared as a running graphical or tabular display of current performance, these data depict trends as well as out-of-limits conditions. Aircraft systems performance data is usually reinforced by reports of component removals or confirmed failures. The choice of units of measurement is not critical, provided that they are constant throughout the operation of the programme and are appropriate to the type and frequency of the events or conditions being recorded. To assess deteriorating performance, the operator should determine timeframes associated with monitoring performance. For example, a programme could monitor the performance standards to measure the most current month, 3-month, and 12-month performance.

8.2.3 Event-Based Programs

An event-based programme monitors and develops recommendations in response to specific operational events. Event-based programs may be used by any size of organization and applied to any size of fleet. This technique should have sufficient amount of data input in order to have the capability of analysing the data to arrive at meaningful and actionable conclusions. Much of the information compiled to assist in the day-to-day operation of your maintenance programme may be effectively used as a basis for this type of continuous mechanical performance analysis. As a measure of maintenance schedule effectiveness, some data types are better suited for event-based programs than others. Events having safety implications or significant operational impact, regardless of the number of occurrences, should be investigated.

8.2.4 Index-Based Programme

This method involves a composite index created and presented using multiple data types. The data should be correlated to a specific aircraft system/subsystem to produce a performance ranking relative to all systems/subsystems being monitored.

8.2.5 Identifying Operational Performance Variations

The following are examples of ways to identify operational performance variations from the performance standards:

(a) Alert-Based:

- Chronic aircraft system alerts.
- Component removal alerts.
- Delay and cancellation alerts.

(b) Trend Monitoring:

- Exhaust gas temperature (EGT) exceedances/trends.
- Aircraft Health Monitoring data.
- Fuel, oil, hydraulic fluid consumption.
- Maximum continuous thrust (MCT) margins (Extended Operations (ETOPS) requirement).

(c) Event-Based:

- In-flight shutdowns.
- Air turn-backs and diversions.
- Cancellations.

(d) Index-Based:

- Ranking of worst-performing aircraft systems/subsystems.
- Routine task findings.
- Minimum equipment list (MEL) management programme effectiveness.

8.3 Other Reasons to Alter a Maintenance Programme

The operator may have other reasons to consider an adjustment to the maintenance programme which are not related to negative operational performance. For example:

- A review of all or part of the current maintenance schedule to ensure maintenance is not occurring too frequently;
- Aircraft appearance concerns;
- Modification/product improvement response: review of tasks for effectiveness in light of modification/product improvement; or
- Maintenance concerns that originate from other elements of the Maintenance Programme rather than as a deficiency in the maintenance task.

8.3.1 TC/STC Approval Holder Source Documents

TC or STC holders source document revisions, including Maintenance Review Board Report (MRBR) or Maintenance Planning Document (MPD) revisions are generated to benefit the aircraft operator community and are a function of aggregating in-service operating experience of the aircraft make/model. These revisions address global in-service experience and reflect new design configurations and new rules. While not required, the operator should perform a documented review of revisions to TC/STC Holder source documents to determine if a change in the maintenance programme is warranted. A defined review period or set of timeline criteria should be included in the procedures, and should be based on:

- Aircraft's performance,
- Operating environment,
- Experience, and
- Programme's goals and philosophy.

9. Analysis and Recommendation

9.1 Root Cause Analysis of Variations from Performance Standard

The operator should should perform and document an analysis in response to the triggers defined in their performance standards system. In addition to the data types they identify, their root cause analysis should also consider other aspects of the operation such as:

(a) Associated flight defects and reductions in operational reliability;

(b) Timing: defects occurring or discovered at line and main bases; in-flight vs. ground operations;

(c) Deterioration observed during routine maintenance;

(d) Post-heavy-maintenance findings;

(e) Service bulletins and modification evaluations;

(f) Adequacy of maintenance equipment;

(g) Technical publications and instructions;

(h) Staff training (see Table 1, Competency Training);

(i) Effects of variation in utilization (high/low);

(j) Effects of seasonality; and

(k) Fleet commonality.

9.1.1 Techniques and Tools

Examples of analytical techniques and tools that may be used include:

(a) Comparisons of operational data types from internal and external sources.

(b) Interpretation of data type trends.

(c) Evaluation of repetitive defects, including:

- No Fault Found (NFF). NFF occurs when a system is tested after a fault is reported but the fault is not replicated during the test.
- Rogue Units. A rogue unit is a single serialized line replaceable unit (LRU) which has demonstrated a history of identical system faults which may or may not result in an exceedance of an operator's defined number of repetitive unscheduled removals within an associated short service life.
- Chronic Units. A chronic unit is a single serialized LRU which has demonstrated a history of different system faults resulting in an exceedance of an operator's defined number of repetitive unscheduled removals within an associated short service life.
- Chronic Systems/Aircraft. A chronic system or aircraft is identified by a specific aircraft serial number which has demonstrated a history of repetitive unscheduled maintenance defects within the same system/subsystem during an operator-defined period of time.

(d) Confidence testing of expected and achieved results.

(e) Studies of life-bands and survival characteristics.

(f) Investigative testing/sampling programs.

(g) Structural review/analysis. To monitor and control structural integrity, competent personnel should review structural service bulletins and industry reports for applicability and urgency. Structural discrepancies should be reviewed with an emphasis on major structural discrepancies.

(h) Weibull analysis. Weibull analysis determines the failure distribution profile and the predictability of failure and is used to determine whether a component or system shows signs of deteriorating performance with age. This statistical method helps in determining if a component may benefit from a restoration task or regular preventative maintenance.

(i) Pareto analysis. Pareto analysis is a simple rank ordering of the number or rate of failures or defects for a given data source. This graphical representation may be effectively used for aircraft out-of-service events, delay and cancellation events, minimum equipment list (MEL) applications and extensions, and other metrics as deemed appropriate. Pareto charts are used to identify the top subjects, which are often targeted for performance improvements.

(j) Failure Mode and Effects Analysis (FMEA).

(k) Maintenance Steering Group (MSG) analysis methods.

(l) Other root cause analysis tools.

9.2 Analysis of Task Effectiveness

The operator should routinely perform an analysis to determine the applicability and effectiveness of the tasks contained within the maintenance programme. This is in addition to the analysis of the task and related operational data performed during optimisation. The evolution of the maintenance programme is not necessarily to simply increase individual task intervals, but to substantiate the accomplishment of an effective task at the appropriate interval, without compromising safety or negatively impacting operational performance beyond that which is acceptable.

9.2.1 Data Selection Criteria

An operator should include in its reliability programme a clear method for determining the relevant type and amount of data that adequately represents its fleet with respect to the maintenance task under consideration. The following describes a method for data selection:

- Consistent,
- Measurable,
- Unbiased,
- Factual,
- Accurate, and
- Repeatable.

10. Reporting and Display Format

10.1 General

All programs will require a means of displaying and reporting summaries of the collected data, analyses performed, and the status of internally approved recommendations.

Common ways of display include graphs, pie charts, bar charts. The operator's Reliability Programme manual should explain the methods of display to be used.

10.1.1 Reporting

Reliability programme report should:

(a) Reflect the operator's operational philosophy and economic goals regarding aircraft performance.

(b) Develop one or more means of displaying and reporting collected data, including data displays summarizing the activity since the last reporting period.

(c) Cover all aircraft systems controlled by the programme in sufficient detail to enable recipients of the information to monitor the effectiveness of the maintenance schedule, including changes in maintenance and inspection intervals, and tasks.

(d) Include enough data to accurately portray the carrier's particular operation(s).

(e) Be frequent enough to identify degrading trends before significant operational impact occurs. eg monthly reports or quarterly reports.

(f) Identify areas which have not achieved the established performance standards.

(g) List continuing unfavourable performance or deficiencies carried forward from previous reports, and details of the progress of corrective actions taken.

(h) Highlight implemented or planned recommendations.

(i) Monitor the effectiveness of revisions to the maintenance schedule.

10.1.2 **Methods and Frequency**

Reliability reporting methods and frequency of reporting may vary by operator and will be dependent upon the complexity of operations. eg monthly reports or quarterly reports.

The Reports could be paper based, or IT based as a package.

10.1.3 **Display**

Operators may choose to incorporate all elements into a single report, or incorporate individual elements into multiple forms and forums, including electronic data displays, structured reports, and/or presentations. They may have one report covering all types in the fleet eg B737-NG, B777 or may elect to produce a dedicated report for each type operated

10.1.4 **Delivery**

The operators report distribution and timeline of delivery should be specified in the reliability programme manual, and the reports should be provided to senior management representatives of the maintenance organization and the OTAA with oversight responsibility.

10.1.5 **Reliability Meetings**

The operator should hold periodic reliability meetings to review the reports and agree any amendments to the maintenance programme resulting from reliability issues. The meeting should be attended by:

- Head of Operator’s Engineering/Airworthiness.
- Chief Pilots of applicable types.
- Applicable Reliability Engineers.
- Head of Maintenance.
- Safety Manager.
- Applicable OTAA representative.
- Type Certificate holder as applicable.

It is imperative that representatives of the OTAA attend the meeting as it is an ICAO obligation that the Authority are involved in the reliability process and it gives then an insight into the reliability of the aircraft on the register.

11. Reliability for Small Fleets

11.1 Reliability programmes are dependent on sufficient data sampling. Fleet size is clearly a factor in data gathering. For small fleet sizes of fewer than 6 aircraft of the same type, the following should be considered:

(a) Complex reliability programmes could be inappropriate for a small fleet. It is recommended that such operators tailor their reliability programmes to suit the size and complexity of operation.

(b) One difficulty with a small fleet of aircraft consists in the amount of available data that can be processed: when this amount is too low, the calculation of alert level is very coarse. Therefore "alert levels" should be used carefully.

(c) An operator of a small fleet of aircraft, when establishing a reliability programme, should consider the following:

(1) The programme should focus on areas where a sufficient amount of data is likely to be processed.

(2) When the amount of available data is very limited, engineering judgement is a vital element. In the following examples, careful engineering analysis should be exercised before taking decisions.

(3) A "0" rate in the statistical calculation may possibly simply reveal that statistical data is missing, rather than no potential problem.

(d) Pooling of data with operators of same aircraft type and having a similar operation (eg flight times, EDTO).

(e) Sharing and obtaining data with the OEMs.

11.2 When alert levels are used, a single event may reach the alert level. Engineering judgement is necessary so as to discriminate an isolated incident from an actual need for a corrective action. It is advisable in such circumstances to review other data sources such as other similar operational data to verify decisions made.