

TTCAA Advisory Circular

**Subject: ACCIDENT PREVENTION AND FLIGHT SAFETY PROGRAMME AND
OCCURRENCE REPORTING
TTCAA Advisory Circular TAC-031B
Date: 05/07/06**

PURPOSE

1. (1) The purpose of this TTCAA Advisory Circular (TAC) is to provide guidance on the development and maintenance of an accident prevention and flight safety programme and the mandatory reporting of occurrences as required by the TTCAA. This TAC also includes a description of the Service Difficulty reporting system for reporting of failures, malfunctions and defects to the Authority and the State of Design.

(2) The accident prevention and flight safety programme described in this TAC meets the requirements of the accident prevention and flight safety system referred to in the TTCARs.

(3) TAC-031B replaces and supercedes TAC-031A which is now cancelled and should be destroyed.

DEFINITIONS

2. (1) The following definitions apply:

- (a) An occurrence includes an incident, serious incident or accident;
- (b) An accident is an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all persons have disembarked, in which-
 - (i) A person is fatally or seriously injured as a result of-
 - (A) Being in the aircraft;
 - (B) Direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or,
 - (C) Direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
 - (ii) The aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft;

- (iii) The aircraft would normally require major repair or replacement of the affected component; except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents or puncture holes in the aircraft skin; or
- (iv) The aircraft is missing or is completely inaccessible;
- (c) A dangerous goods accident is an occurrence associated with and related to the transport of dangerous goods which results in fatal or serious injury to a person or major property damage.
- (d) An incident is an occurrence other than an accident associated with the operation of an aircraft which affects or could affect the safety of operation;
- (e) A dangerous goods incident is an occurrence, other than a dangerous goods accident, associated with and related to the transport of dangerous goods, not necessarily occurring on board an aircraft, which results in injury to a person, property damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packing has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardizes the aircraft or its occupants is also deemed to constitute a dangerous goods incident
- (f) A serious incident is an incident involving circumstances indicating that an accident nearly occurred;
- (g) A hazard is any condition, event or circumstance which could induce an accident, incident or failure;
- (h) Risk is the consequence of accepting a hazard.

REQUIREMENTS

3. (1) Under TTCAR No.3:37.(1) a national air operator is required to establish and maintain an accident prevention and flight safety programme, which may be integrated with his Quality System under TTCAR No.3:16, to include -

- (a) Procedures to achieve and maintain risk awareness by all persons involved in operations;
- (b) An occurrence reporting scheme to enable the collation and assessment of relevant incident and accident reports in order to identify adverse trends or to address deficiencies in the interest of flight safety;
- (c) A system for the evaluation of relevant information relating to incidents and accidents and the promulgation of related information, but not the attribution of blame; and
- (d) The appointment of a person accountable for managing the system.

(2) An accident prevention and flight safety programme must include the following elements which must also be described in the appropriate manuals:

- (a) Qualifications of the flight safety person;
- (b) Responsibilities of the flight safety person;
- (c) Training for the flight safety person;
- (d) Incident management;

- (e) Flight safety committee;
- (f) Emergency response planning; and
- (g) Communication and safety education.

(3) TTCAR No.3:IS37 prescribes the contents and structure of an accident prevention and flight safety programme.

OBJECTIVE OF ACCIDENT PREVENTION AND FLIGHT SAFETY PROGRAMME

4. (1) The objective of an accident prevention and flight safety programme is to prevent aircraft accidents, thus improving public confidence in the safety of air travel, saving lives and money and reducing suffering.

(2) An accident prevention and flight safety programme should be designed to prevent personal injury and property losses resulting from accidents and incidents. The design criteria should include: motivation of safe actions through establishment of a dynamic corporate safety culture; identification of hazards to safe operations; working with other departments within the organization to develop and implement safety interventions; monitoring intervention strategies to validate effectiveness; and communicating the results throughout the organization.

GUIDANCE FOR THE ESTABLISHMENT OF AN ACCIDENT PREVENTION AND FLIGHT SAFETY PROGRAMME

5. (1) Further guidance on the establishment of an accident prevention and flight safety programme and flight data monitoring can be found in the following documents:

- (a) ICAO Doc 9422 (Accident Prevention Manual); and
- (b) ICAO Doc 9376 (Preparation of an Operational Manual).

(2) Operators should make use of these documents to support the TTCAR requirements in the development of their accident prevention and flight safety programme required by TTCAR No.3:37.

MANAGEMENT AND RISK ASSESSMENT

Management

6. (1) The slogan “safety is everybody’s business” means that everyone should be aware of the consequences of his mistakes and strive not only to avoid them but also to create an atmosphere in which the potential for problems due to mistakes is highlighted before it becomes an incident or accident. Everyone should also remain alert to detect hazards and take appropriate action including reporting, to prevent them developing into an incident or accident. For example, if a loose article is detected on the ramp, it is in everyone’s interest to remove it and report it as appropriate. Motivating an interest and awareness of safe aviation practices by all persons involved in operations must be one of the first steps of an accident prevention and flight safety programme.

(2) Executive management would nominate a person to be responsible for managing the accident prevention and flight safety programme. This would normally be the Director (or Manager) Flight Safety who would act as an accident prevention advisor (APA), advising management on methods to improve safety. Requirements for a Director of Flight Safety are developed further at Appendix A of this TAC.

(3) The responsibility for safety and thus accident prevention in any organization ultimately rests with executive management, because of the control of resources. Executive management is responsible for fostering the basic motivation so that each employee develops an

awareness of safety. To achieve this, executive management must ensure that the proper working environment, adequate training and supervision and the correct facilities and equipment are available. Executive management's responsibilities for safety go well beyond financial provisions. Encouragement and active support of accident prevention and flight safety programmes must be clearly visible to all staff if such programmes are to be effective. For example, in addition to determining who was responsible for an incident or accident, executive management should also seek the underlying factors that induced the human error. Such an investigation may well indicate faults in executive management's own policies and procedures.

(4) Complacency or a false sense of security should not be allowed to develop as a result of long periods without an accident or serious incident. An organization with a good safety record is not necessarily a safe organization. Good fortune rather than good management practices may be responsible for what appears to be a safe operation.

(5) On the whole, executive management's attitudes and behaviour have a profound effect on staff. For example, if executive management is willing to accept a lower standard of maintenance, then the lower standard can easily become the norm. Or, if the company is in serious financial difficulties, staff may be tempted or pressured into lowering their margins of safety by "cutting corners", as a gesture of loyalty to the company, or even self-interest in retaining their jobs. Consequently, such practices can and often do lead to the introduction of hazards.

(6) Morale within an organization also affects safety. Low morale may develop for many reasons but nearly always leads to loss of pride in one's work, an erosion of self-discipline and other hazard creating conditions.

Risk Assessment

7. (1) A hazard is any condition, event or circumstance which could induce an accident, incident or failure; risk is the consequence of accepting a hazard. It is imperative that all staff are made aware of hazards and the consequences of such acceptance. Risk-taking is an accepted fact of commercial life, and can therefore influence executive management's attitudes towards safety. An illustration of this fact could be executive management's acceptance of non-standard equipment in an aircraft fleet rather than spending additional money to standardize the equipment. This will almost certainly introduce hazards since variations in the equipment installed in the same aircraft type are known to have caused accidents.

(2) A person may act in an unsafe manner because he may not have correctly assessed the risks involved in his action. Risk perception and acceptance varies according to the situation. In certain situations a person may be tempted to take risks that he would not normally take. Therefore, when attempting to determine why a person's response to a situation was inadequate, it is important to consider all the factors that may have affected him, including his perception and the risks involved.

(3) Risk, which may be considered the opposite of safety, can exist in a safety environment. Since an element of risk is present in most human activities, risk taking is familiar to everyone in his normal daily life. In aviation, risk will be present as long as aircraft fly and this truth has resulted in efforts to reduce or control risk by all possible means. While aviation by its very nature comprises of risks, it is also an area where the penalties for failure are high. Accordingly, the taking of risks needs to be carefully weighed against the perceived benefits.

(4) Risks are usually categorized by the broad areas they threaten, such as assets, income and legal liability. In the aviation industry, accidents usually involve all three areas. Since accidents can be considered as involuntary and unscheduled expenditures, an accident prevention and flight safety programme must have procedures to achieve risk awareness by all persons involved in operations as required by TTCAR No.3:37.(1)(a).

OCCURRENCE REPORTING SCHEME

The Objectives of the Scheme

8. (1) The overall objective of the occurrence reporting scheme required by TTCAR No.3:37. (b) is to enable the collation and assessment of relevant incident and accident reports in order to identify adverse trends or to address deficiencies in the interest of flight safety. The objective is to use reported information to improve the level of flight safety and not to attribute blame.

(2) The detailed objectives of the scheme are:

- (a) To enable an assessment of the safety implications of each relevant incident and accident to be made, including previous similar occurrences, so that any necessary action can be initiated; and
- (b) To ensure that knowledge of relevant incidents and accidents is disseminated so that other persons and organizations may learn from them.

(3) The scheme is an essential part of the overall monitoring function; it is complementary to the normal day to day procedures and 'control' systems and is not intended to duplicate or supersede any of them. The scheme is a tool to identify those occasions where routine procedures have failed.

(4) Occurrences should remain in the database when judged reportable by the person submitting the report as the significance of such reports may only become obvious at a later date.

(5) Under TTCAR No.2:67 and 68, a pilot in command is required to submit a report to the Authority of any occurrence that endangers or could endanger the safety of operation. It is also important that an operator distinguishes between the Mandatory Occurrence Reporting requirements for reporting all occurrences that endanger or could endanger the safety of operations as required by TTCAR No.2: 67 (1) (a), and the Service Difficulty Report (SDR) requirements for reporting of failures, malfunctions defects and other occurrences which cause or might cause adverse effects on the continued airworthiness of an aircraft as required by TTCAR No.3:76(2) (c) and No.5:22. The SDR system is described in more detail at Appendix B.

(6) In addition to the Occurrence Report form TF-053, an operator, is also required to complete and submit the SDR form TF-040 as described in Appendix B, for any occurrence which endangers or could endanger the safety of operations which arise from –

- (a) Any failure, malfunction or defect in the aircraft , its equipment or any item of ground support equipment; or
- (b) Which causes or could cause adverse effects on continuing airworthiness of an aircraft.

Occurrences That Must Be Reported

9. (1) Incidents that have to be reported and responsibilities for submitting reports are described in TTCARs No.2:25, and No.2:67-74. In addition TTCAR No.3:76(2)(c) and No.5:22 require reporting of failures, malfunctions, defects and other occurrences that might cause adverse effects on the continued airworthiness of aircraft. The number of variables in aircraft operations is so great that it is very difficult to provide a complete list of items or conditions which should be reported. For example, loss of a single hydraulic system on an aircraft with only one such system is critical; on a type with three or four systems it could be less critical. A relatively minor problem in one set of circumstances can, when these circumstances change, result in a hazardous situation. The rule should be: "If in doubt - report." Nevertheless, Appendix C is a list of occurrences which should be reported.

(2) To facilitate consistent reporting and subsequent storage and analysis of data, Occurrence Report form TF-053 (see Appendix D) ideally should be used for all mandatory occurrence reports except bird strike reports required by TTCAR No. 2:71 which should be reported on TTCAA form LIC-042 (see example at Appendix E). Service difficulty reports (SDR) must be made on Form TF-040 (See Appendix B). Organizations may wish to use an occurrence report form designed to meet their own requirements. In such cases the 'in house' document(s) should, as far as possible, follow the general format of the TTCAA form TF-053.

(3) TTCAR No.2:25 and No. 2:IS25 deal specifically with the reporting of dangerous goods incidents and accidents which must be reported on Form TF-065 (See Appendix F). To assist the ground services in preparing for the landing of an aircraft in an emergency situation, it is essential that adequate and accurate information about any dangerous goods on board be given to the appropriate air traffic services unit. Wherever possible this information should include the proper shipping name and/or the UN/ID number, the class/division and for Class 1 the compatibility group, any identified subsidiary risk(s), the quantity and the location on board the aircraft. When it is not considered possible to include all the information, those parts thought most relevant in the circumstances, such as the UN/ID numbers or classes or divisions and quantity, should be given.

(4) TTCAR No. 2:67-74 deal with reporting of incidents and accidents other than dangerous goods incidents or accidents.

RESPONSIBILITIES OF OPERATOR AND ORGANIZATION

Action by Operator and Organization

10. (1) Where a reported occurrence indicates an unpremeditated or inadvertent lapse by an employee, the TTCAA would expect the Operator or Organization to act responsibly and to share its view that free and full reporting is the primary aim, and that every effort should be made to avoid action that may inhibit reporting. The TTCAA will, accordingly, make it known to operators and organizations that, except to the extent that action is needed in order to ensure safety, and except in cases involving dereliction of duty amounting to gross negligence, it expects them to refrain from disciplinary or punitive action which might inhibit their staff from duly reporting incidents of which they may have knowledge.

(2) The primary responsibility for safety rests with the management of the organizations involved (Air Operators, Maintenance Organizations, etc). The Occurrence Reporting Scheme is an established part of the Operator's monitoring involving the recording of occurrences, the investigation of occurrences in conjunction with the appropriate organization (e.g. Aircraft and Equipment Manufacturer, Operating Agency, Maintenance Organization) and when necessary the TTCAA, to investigate occurrences in order to establish the cause sufficiently to devise, promulgate and implement any necessary remedial and preventive action.

Submission of Reports

11. (1) Although the TTCARs sometimes refer to individuals required to report occurrences, the operator or organization has the responsibility for the management of the occurrence reporting scheme required by his accident prevention and flight safety programme. When an individual making a report is a person having a duty to report to the TTCAA in accordance with the TTCAR, the operator/organization must tell him if his report has been passed on to the TTCAA or not. If not, and the employee is convinced that it should be, he must have the right to insist that the report be passed to the TTCAA or to report it directly to the TTCAA himself. Procedures to ensure that this right of the individual reporter is maintained must be incorporated in the organization's reporting procedures and be clearly stated in the relevant instructions to staff.

(2) An individual may submit an occurrence report directly to TTCAA should he wish to do so, but in the interest of flight safety he would be strongly advised also to notify his operator/organization, preferably by a copy of the report, unless confidentiality is considered essential.

(3) Reports must be despatched within 72 hours of the event, unless exceptional circumstances prevent this. Nevertheless, when the circumstances of an occurrence are judged to be particularly hazardous, the TTCAA expects to be advised of the essential details by the fastest possible means (e.g. email/telephone/fax/telex). This should be followed up within 72 hours by a full written report to the TTCAA.

(4) Should the initial report be incomplete in respect of any item of information required by the TTCARs, a further report containing this information must be made within 72 hours of the information becoming available. Prompt advice to the TTCAA on the results of investigations and the actions taken to control the situation will minimize or may render unnecessary, any direct TTCAA involvement in the investigative activity.

(5) In the case of technical failures or service difficulty reports, the availability of photographs and/or preservation of damaged parts will greatly facilitate the subsequent investigation.

(6) Where a maintenance organization is in doubt about the applicability of the reporting requirements, e.g. it discovers a defect in a piece of equipment which cannot be associated with a particular aircraft, or even a type of aircraft, it should, nevertheless, make a report in order to ensure that it has complied with the TTCARs. The TTCAA would, in any case, wish the organization, or individual, to report voluntarily such defects on equipment fitted to aircraft types not subject to mandatory reporting.

(7) An operator must report dangerous goods accidents and incidents to the TTCAA and the appropriate authority of the State in which the accident or incident occurred in accordance with the reporting requirements of those appropriate authorities.

(8) An operator must report any occasion when undeclared or misdeclared dangerous goods are discovered in cargo. Such a report must be made to the TTCAA and the appropriate authorities of the State in which this occurred. An operator must also report any occasion when dangerous goods not permitted under the Technical Instructions are discovered in passengers baggage. Such a report must be made to the appropriate authority of the State in which this occurred.

(9) In the event of an aircraft accident or serious incident, the operator of an aircraft carrying dangerous goods as cargo must provide information, without delay, to emergency services responding to the accident or serious incident about the dangerous goods on board, as shown on the copy of the information to the pilot-in-command. As soon as possible, the operator must also provide this information to the TTCAA and the appropriate authorities of the State in which the accident or serious incident occurred.

(10) In the event of an aircraft incident, the operator of an aircraft carrying dangerous goods as cargo must, if requested to do so, provide information without delay to the emergency services responding to the incident and to the appropriate authority of the State in which the incident occurred, about the dangerous goods on board, as shown on the copy of the information to the pilot-in-command.

EVALUATION OF INCIDENT AND ACCIDENT INFORMATION

Flight Data Monitoring and Analysis Programme

12. (1) Effective 1 January 2005, for an operator of an aeroplane of a maximum certified take off mass in excess of 27,000 kg, evaluation of incident and accident information must include the establishment and maintenance of a flight data monitoring and analysis programme as part of the accident prevention and flight safety programme. An operator may contract out the operation of a flight data monitoring and analysis programme to another party, but must retain overall responsibility for the maintenance of such a programme.

(2) The manager of the accident prevention and flight safety programme is accountable for the discovery of issues and the transmission of these to the relevant manager(s) responsible for the process (es) concerned. The latter are accountable for taking appropriate and practicable safety action within a reasonable period of time that reflects the severity of the issue.

(3) A flight data monitoring and analysis programme will allow an operator to:

- (a) Identify areas of operational risk and quantify current safety margins;
- (b) Identify and quantify operational risks by highlighting when non-standard, unusual or unsafe circumstances occur;
- (c) Use flight data information on the frequency of occurrence, combined with an estimation of the level of severity, to assess the safety risks and to determine which may become unacceptable if the discovered trend continues;
- (d) Put in place appropriate procedures for remedial action once an unacceptable risk, either actually present or predicted by trending, has been identified;
- (e) Confirm the effectiveness of any remedial action by continued monitoring.

(4) Flight data monitoring and analysis techniques include using the in-flight digital data for the following:

- (a) Monitoring for deviations from flight manual limits and standard operating procedures. A set of core events should be selected to cover the main areas of interest to the operator. A sample list is at Appendix G. The event detection limits should be continuously reviewed to reflect the operator's current operating procedures;
- (b) Monitoring all flights through a system of snapshots of information to determine what is normal practice;
- (c) Collection and measurement of flight data to support the analysis process. Examples of this type of data could include the numbers of flights flown and analysed, aircraft and sector details sufficient to generate rate and trend information.

Monitoring Tools

13. The effective assessment of information obtained from digital flight data is dependent upon the provision of appropriate information technology tool sets. A programme set of tools for this purpose may include: annotated data trace displays, engineering unit listings, visualization for the most significant incidents, access to interpretative material, links to other safety information, and statistical presentations. Where this function is contracted out, the operator must ensure that the contractor is suitably equipped for the task.

Education and Publication

14. Sharing safety information is a fundamental principle of aviation safety in helping to reduce accident rates. The operator should pass on the lessons learnt to all relevant personnel and, where appropriate, industry. Media used may include: newsletters, flight safety magazines, highlighting examples in training and simulator exercises, periodic reports to industry and the regulatory authority.

Avoiding Conflict with Investigation Requirements

15. Accident and incident data requirements specified in TTCAR No.7:Part VII take precedence over the requirements of a flight data monitoring and analysis programme. In these cases the flight data recorder data should be retained as part of the investigation data.

Consistency of Reporting

16. Every crew member has a responsibility to report events described in TTCAR No.2:25 and No. 2:67-74 using the company occurrence reporting scheme detailed in TTCAR No.3:37(b). Significant risk-bearing incidents detected by flight data monitoring and analysis will therefore normally be the subject of mandatory occurrence reporting by the crew. If this is not the case then the crew should submit a retrospective report that will be included under the normal accident prevention and flight safety process without prejudice.

Handling of Flight monitoring and Analysis Data

17. (1) The data recovery strategy should ensure a sufficiently representative capture of flight information to maintain an overview of operations. Data analysis should be performed at an appropriate frequency to enable action to be taken on significant safety issues.

(2) The data retention strategy should aim to provide the greatest safety benefits practicable from the available data. A full data set should be retained until the action and review processes are complete; thereafter, a reduced data set relating to closed issues can be maintained for longer term trend analysis. Programme managers may wish to retain samples of full-flight data (de-identified) for various safety purposes (detailed analysis, training, benchmarking etc.).

(3) Data access and security policy should restrict information access to authorised persons. When data access is required for airworthiness and maintenance purposes, a procedure should be in place to prevent disclosure of crew identity.

Procedure Document

18. A procedure document for the use of flight data for the flight monitoring and analysis programme should be signed by all parties (airline management, flight crew member representatives nominated either by the union or the flight crew themselves) and, as a minimum, should define.

- (a) The aim of the flight data monitoring and analysis programme;
- (b) A data access and security policy that should restrict access to information to specifically authorized persons identified by their position;
- (c) The method to obtain de-identified crew feedback on those occasions that require specific flight follow-up for contextual information; where such crew contact is required the authorised person(s) need not necessarily be the programme manager, or safety manager, but could be a third party (broker) mutually acceptable to unions or staff and management;
- (d) The data retention policy and accountability including the measures taken to ensure the security of the data;

- (e) The conditions under which, on rare occasions, advisory briefing or remedial training should take place; this should always be carried out in a constructive and non-punitive manner;
- (f) The conditions under which the confidentiality may be withdrawn for reasons of gross negligence or significant continuing safety concern;
- (g) The participation of flight crew member representative(s) in the assessment of the data, the action and review process and the consideration of recommendations;
- (h) The policy for publishing the findings resulting from the flight data monitoring and analysis programme.

Airborne Systems and Equipment

19. Airborne systems and equipment used to obtain data used for the flight data monitoring and analysis programme may range from an already installed full quick access recorder, in a modern aircraft with digital systems, to a basic crash protected recorder in an older or less sophisticated aircraft. The analysis potential of the reduced data set available in the latter case may reduce the safety benefits obtainable. The operator shall ensure that flight data monitoring and analysis use does not adversely affect the serviceability of equipment required for accident investigation.

RESPONSIBILITIES OF THE TTCAA IN ACCIDENT PREVENTION AND FLIGHT SAFETY

20. (1) The primary responsibility for safety rests with the management of the organizations involved (operators, maintenance organizations, manufacturers, etc). The responsibility of the TTCAA is to provide the regulatory framework within which the civil aviation industry must work and thereafter to monitor performance to be satisfied that required standards are set and maintained. In relation to all reported occurrences, including those raised by its own personnel, the TTCAA will -

- (a) Evaluate each occurrence report received;
- (b) Decide which occurrences require investigation by the TTCAA in order to discharge its functions and responsibilities;
- (c) Make such checks as it considers necessary to ensure that operators, AMOs, air traffic control services and aerodrome operators are taking any necessary remedial and preventive action in relation to reported occurrences;
- (d) Take such steps as are open to it to persuade foreign aviation authorities and organizations to take any necessary remedial and preventive action in relation to reported occurrences;
- (e) Assess and analyse the information reported to it in order to detect safety problems which may not be apparent to individual reporters;
- (g) Make available the results of studies of the data provided to those who will use them for the benefit of air safety;
- (h) Where appropriate, issue specific advice or instructions to particular sections of the industry;
- (i) Where appropriate, take action in relation to legislation, requirements or guidance,

(2) The TTCAA will evaluate all reported occurrences to determine those that require TTCAA involvement and follow-up action. These reports will then be classified as “OPEN” by ticking the “OPEN” box at part 7 of the completed occurrence report form TF-053 submitted by the reporting organization.. The TTCAA will then coordinate with the reporting organization to ensure satisfactory action. The report will be accepted as “CLOSED” and the “CLOSED” box ticked, only when the TTCAA is satisfied that appropriate action has been taken to adequately control the identified hazard. The TTCAA will also record as “CLOSED” all other reports not requiring TTCAA follow-up action. The TTCAA will in addition –

- (a) Record all occurrences on a database;
- (b) Continuously monitor all incoming data for significant hazards or potential hazards using previously stored data, when appropriate and alerting departments and organizations as necessary;
- (c) Conduct regular monitoring of stored data to identify hazards or potential hazards;
- (d) Carry out searches and analyses of stored data in response to requests from within the TTCAA or industry and draw attention, by appropriate means, to any lessons learnt.

Occurrences Closed on Receipt

21. A number of occurrences reported to the TTCAA, while meeting the criteria for a reportable occurrence, may have been adequately dealt with by the reporting organization. Thus, there is no justification for further investigation by the TTCAA, although details of the occurrence and action taken do provide valuable information for dissemination and storage purposes. Reports judged to be in this category are CLOSED on receipt by the TTCAA. The principal justification for closure being that it is evident from the report that existing requirements, procedures, documentation, etc., coupled with the reporter’s action, have adequately controlled the identified hazard. When necessary a TTCAA representative will liase with the reporter and/or seek advice from appropriate TTCAA staff in making this decision. The ability of the TTCAA to close an occurrence on receipt and thus avoid the need for further TTCAA investigation is very much dependent upon the quality of the information provided in the report and, specifically, information on the action taken by the reporting organization to control the situation.

Action in Respect of a Certificate

22. The TTCAA has a duty to amend, suspend or revoke a certificate as appropriate if it is no longer satisfied that the certificate holder is competent, medically fit or a fit person to exercise the privileges of the certificate. If an occurrence report suggests that the certificate holder does not satisfy these requirements, the TTCAA will take appropriate certificate action. For example, if the report indicates that the certificate holder requires further training, the TTCAA may suspend his certificate until he has undergone such training. If a report should indicate that the certificate holder may not be a fit person to exercise the privileges of his certificate, the fact that he has reported the occurrence will be taken into account in determining his fitness and may weigh in his favour. In all such cases, when considering what action to take, the TTCAA will take into account all relevant, available information about the circumstances of the occurrence and about the certificate holder.

Submission of Reports by Individuals

23. An individual may submit an occurrence report directly to TTCAA should he wish to do so, but in the interest of flight safety he would be strongly advised also to notify his organizations, preferably by a copy of the report, unless confidentiality is considered essential. When appropriate, the organization, in turn, should then advise the aircraft or equipment manufacturer(s).

Ramesh Lutchmedial
Director General of Civil Aviation

APPENDIX A

DIRECTOR OF FLIGHT SAFETY

Functions

1. (1) One of the functions of a Director of Flight Safety is to develop and implement a comprehensive accident prevention and flight safety programme. It is important that the accident prevention and flight safety programme emphasizes operational safety, including all aspects of flight and ground operations, maintenance programmes and passenger safety.

(2) The Director of Flight Safety should ensure that the necessary flight safety programme elements have been developed, properly integrated, and coordinated throughout organization. These elements include:

- (a) A safety incident/accident reporting system;
- (b) Accident/incident investigation;
- (c) Safety audits and inspections;
- (d) Internal evaluation programme;
- (e) Operational risk assessment programme;
- (f) Open reporting systems;
- (g) Routine monitoring and trend analysis programmes;
- (h) Review of external evaluation programmes;
- (i) Safety Committee(s).

(3) The Director of Flight Safety should ensure that the accident prevention and flight safety programme has been disseminated to all appropriate personnel and a detailed description of the programme is incorporated in the appropriate manuals as described in TTCAR No.3:IS37.

(4) The Director of Flight Safety should -

- (a) To the greatest extent possible, be autonomous and separate from other departments and report directly to the chief executive officer;
- (b) Ensure that adequate accident prevention and flight safety programme management is maintained;
- (c) Have direct access to the appropriate level of senior management and to all managers/supervisors on safety issues;
- (d) Provide safety concerns and findings to appropriate senior operations managers for appropriate corrective actions;
- (e) Be a primary participant in the development of an internal evaluation program and the resultant safety audit procedures.

Training, Qualifications and Experience

2. (1) **Training.** It is highly desirable that the Director of Flight Safety completes an aviation safety education programme consistent with the position's responsibilities. If an individual has not completed such a programme prior to appointment, the Director of Flight Safety should attend one to supplement his experience. Participation in industry safety meetings, conferences or schools is considered an essential part of the continuing education of the Director of Flight Safety. Training should also include such subject areas as:

- (a) Corporate safety culture;
- (b) The role of the safety director as advisor to senior management officials;
- (c) Flight safety philosophy;
- (d) Aviation safety survey;
- (e) Safety data collection and analysis programmes;
- (f) Risk management;
- (g) Accident and incident management;
- (h) Emergency response plan;
- (i) Incident/accident prevention and investigation;
- (j) Human factors.

(2) **Qualifications and Experience.** The person assigned as the Director of Flight Safety should have extensive operational management experience and established professional qualifications in aviation with knowledge and understanding of aviation accident prevention and flight safety programmes, aviation safety standards and safe operating practices. His qualifications may be any of the following:

- (a) A commercial pilot or airline transport pilot licence;
- (b) An aircraft maintenance engineer licence;
- (c) A flight dispatcher licence or flight operations officer authorization or military equivalent.

(3) **Responsibilities.** The Director of Flight Safety shall have direct access to the operations manager in flight safety matters and shall be responsible for managing the flight safety programme by-

- (a) Monitoring and advising on all national air operator flight safety activities which may have an impact on flight safety;
- (b) Establishing a reporting system which provides for a timely and free flow of flight safety related information;
- (c) Conducting safety surveys;
- (d) Soliciting and processing flight safety improvement suggestions;
- (e) Developing and maintaining a safety awareness programme;
- (f) Monitoring industry flight safety concerns which may have an impact on air operator operations;
- (g) Maintaining close liaison with aeroplane manufacturers;
- (h) Maintaining close liaison with the Authority on Safety issues;
- (i) Maintaining close liaison with industry safety associations;
- (j) Developing and maintaining the air operator accident response plan;
- (k) Identifying flight safety deficiencies and making suggestions for corrective action;
- (l) Investigating and reporting on incidents/accidents and making recommendations to preclude a recurrence;

- (m) Developing and maintaining a flight safety database to monitor and analyze trends;
- (n) Making recommendations to the air operator senior management on matters pertaining to flight safety; and
- (o) Monitoring the response and measuring the results of flight safety initiatives.

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APPENDIX B

SERVICE DIFFICULTY REPORTING SYSTEM (for the reporting of failures, malfunctions, and defects)

Background

1. (1) Aircraft are designed by design organizations and certified by their respective States of Design to applicable airworthiness standards. An aircraft while in service, however, may experience service difficulties such as faults, malfunctions, defects and other occurrences. For the Authority to satisfy its responsibilities under the Convention on International Civil Aviation, it is essential that operators and maintenance organizations inform the Authority of all service difficulties experienced.

(2) The service difficulty report on failures, malfunctions, and defects required by TTCAR No. 3:76(2)(c) and No.5:22 apply to aeroplanes over 5700 kg and helicopters over 3180 kg maximum certified takeoff mass. In addition to informing the Authority, an operator is required under TTCAR No.3:76(2)(c) and No. 5:22 to inform the State of Registry for an aircraft registered in a foreign state, the Authority of the State of Design and the holder of the Type Certificate of all service difficulties experienced.

(3) The organization responsible for the type design, receiving service difficulties information from all operators of the type of aircraft, is in the best position to develop recommendations to solve the problems of the aircraft in service. Recommendations issued by that organization may be in the form of service bulletins, alert service bulletins or all operator letters.

(4) The State of Design, being the certifying authority of the type of aircraft will, where necessary, make the recommendations issued by the organization responsible for the type design, mandatory and initiate changes to the airworthiness requirements as appropriate.

(5) The recommendations (service bulletins, etc.) issued by the organization responsible for the type design and the information made mandatory by the State of Design (airworthiness directives, etc.) should be obtained by all operators and the appropriate actions taken.

General

2. (1) The Service Difficulty Reporting System is established to support the Authority in its mandate to foster an acceptable level of safety by:

- (a) Promoting product improvement;
- (b) Detecting trends (as opposed to isolated cases);
- (c) Determining reliability of accessories (to aid in setting inspection and replacement periods); and
- (d) Enabling a more meaningful advisory service to aircraft operators.

(2) The current aircraft population is too large to achieve full knowledge of all potential safety problems solely through inspection. The Service Difficulty Report (SDR) assists in effective decision making, manpower utilization and enhancement of safety.

(3) The SDR is a feedback system which provides a most effective resource for effective decision-making on matters of reliability and airworthiness and provides the intelligence needed to assess defects, institute early corrective action and thus assist in accident prevention.

(4) An effective SDR programme will provide information which will enable the Airworthiness Inspectorate to provide an improved advisory service to the operators.

Sources of Information for the Service Difficulty Report

3. TTCAR No.3:76(2)(c) and No. 5:22 require operators, maintenance organizations, Air Traffic Controllers, Pilots and holders of Aircraft Maintenance Licences to the Director General any faults, failures, malfunctions or defects and other occurrences on any Trinidad and Tobago aircraft under his control which cause or might cause adverse effects on the continued airworthiness of the aircraft. Significant malfunctions, failures, or conditions brought to the attention of or noted by the Airworthiness Inspector during surveillance of aviation industry activities should also be reported.

Guidelines for Reporting

4. (1) The SDR should be submitted on a form TF-040 to the Authority, the State of Design, Authority and the holder of the Type Certificate. If the operator is operating a foreign aircraft the SDR should also be sent to the State Registry. A SDR is required for each malfunction, failure, or defect that occurs under the reportable categories. This includes any such failure that occurs subsequent to a similar failure previously reported. One-time reporting of similar defects is unacceptable. In addition, each operator should report any other failure, malfunction, or defect in an aircraft that occurs or is detected at any time, if in the holder's opinion that failure, malfunction or defect has endangered or may endanger the safe operation of an aircraft.

(2) Each operator should report the occurrence or detection of each failure, malfunction or defect concerning at least the following:

- (a) Fires during flight and whether the related fire-warning system functioned properly;
- (b) Fires during flight not protected by a related fire-warning system;
- (c) False fire warning during flight;
- (d) An engine exhaust system that causes damage during flight to the engine, adjacent structure, equipment, or components;
- (e) An aircraft component that causes accumulation or circulation of smoke, vapour, or toxic or noxious fumes in the crew compartment or passenger cabin during flight;
- (f) Engine shutdown during flight because of flameout;
- (g) Engine shutdown during flight when external damage to the engine or aircraft structure occurs;
- (h) Engine shutdown during flight due to foreign object ingestion or icing;
- (i) Shutdown during flight of more than one engine;
- (j) A propeller feathering system or ability of the system to control over-speed during flight;
- (k) A fuel or fuel-dumping system that affects fuel flow or causes hazardous leakage during flight;
- (l) A landing gear extension or retraction, or opening or closing of landing gear doors during flight;

- (m) Brake system components that result in loss of brake actuating force when the aircraft is in motion on the ground;
- (n) Aircraft structure that requires major repair;
- (o) Cracks, permanent deformation, or corrosion of aircraft structure, if more than the maximum acceptable to the manufacturer or the TTCAA;
- (p) Aircraft components or systems that result in taking emergency actions during flight (except action to shut down an engine).
- (q) Each interruption to a flight, unscheduled change of aircraft en route, or unscheduled stop or diversion from a route, caused by known or suspected mechanical difficulties or malfunctions;
- (r) Any abnormal vibration or buffeting caused by a structural or system malfunction, defect or failure;
- (s) A failure or malfunction or more than one attitude, airspeed or altitude instrument during a given operation of the aircraft.
- (t) The number of engines removed prematurely because of malfunction, failure or defect, listed by make and model and the aircraft type in which it was installed; and
- (u) The number of propeller featherings in flight, listed by type of propeller and engine and aircraft on which it was installed.

(3) In addition to the reports required above, each operator should report any other failure, malfunction or defect in an aircraft that occurs or is detected at any time, if in his opinion, the failure, malfunction or defect has endangered or may endanger the safe operation of the aircraft.

Significant Reports

5. (1) Reports that concern:

- (a) Primary structure failure;
- (b) Control system failure;
- (c) Fire in the aircraft;
- (d) Engine structural failure; or
- (e) Any other condition considered an imminent hazard to safety,

warrant immediate notification of the Authority by telephone or telex. The telephone or telex report should follow the format of the Service Difficulty Report and being of an alert nature, should contain the following information when available and relevant:

- (a) Aircraft owner's name and address;
- (b) Whether accident or incident;
- (c) Related service bulletins, service letters, airworthiness directives; and
- (d) Disposition of the defective parts.

(2) The information contained in the telephone or telex report should be entered on the SDR form and submitted in the normal manner to the Authority as soon as possible after the telephone/telex submission.

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SERVICE DIFFICULTY REPORT

(To be used for reporting of Failures, Malfunctions and Defects as required by TTCAR
No.3:76(2)(c)) and No.5:22

1 Registration No. 9Y-		2 (a) Civil Aviation Authority (P.O. Box 2163, National Mail Centre Piarco Trinidad)		3 Date of Occurrence			
4 Location:		2 (b) (Address of State Of Design Authority)		2 (c) (Address of Type Certificate Holder)			
						5 Date Submitted	
				6 OPEN <input type="checkbox"/> CLOSED <input type="checkbox"/>			
		Make		Model			
		Serial No.		8 Phase of Operation/Maintenance			
7 (a) Aircraft						Ground <input type="checkbox"/> Taxi <input type="checkbox"/>	
(b) Powerplant						Take-off <input type="checkbox"/> Climb <input type="checkbox"/>	
(c) Propeller				Cruise <input type="checkbox"/>			
9 System/Component (assembly that includes Part)				Descent <input type="checkbox"/> Landing <input type="checkbox"/>			
Name		Make		Model			
				Serial No.			
10 Specific Part (of Component) causing problem							
Name		Number		Part/Defect Location			
12 ATA Code		13 Part TT		14 Part TSO			
				15 Part Condition			
11 Submitted by:							
Operator <input type="checkbox"/> AMO <input type="checkbox"/>							
Air Traffic Controller <input type="checkbox"/>							
Pilot <input type="checkbox"/> AMEL <input type="checkbox"/>							
16 <u>Comments</u> (Describe the service difficulty and the circumstances under which it occurred. State probable cause and recommended corrective action to prevent recurrence, use reverse side if needed.)							
17							
Name _____		Signature _____		Organization _____			

TTCAA Form TF-040

INSTRUCTIONS FOR COMPLETING SAMPLE FORM

- (1) Enter the registration number shown on the aircraft such as 9Y-THA, 9Y-TGX, 9Y-TCR, etc.
- (2) The completed forms are to be sent to these addresses.
- (3) Actual date of the occurrence.
- (4) Place where the difficulty occurred such as JFK, LHR, POS, YYZ, etc.
- (5) Actual date the form was mailed.
- (6) Open - Tick this block if the report is not complete and there is more information forthcoming.

Closed - Tick this block if the report is complete and there is not expected to be any further information on this particular occurrence. Supplemental reports are entered as “Supp.#1 open” if there is more information to follow or “Supp. Closed” indicating that this is the final report.

(7) a) Aircraft

-Make : The aircraft manufacturer's name; any meaningful abbreviation should be acceptable such as B for Boeing, DH for De Havilland or BE for Beechcraft.

-Model/series: This information should be the official designation of the aircraft as listed in the Aircraft Specification Data Sheets or Type Data Sheets.

- Serial number: The serial number assigned by the manufacturer.

b) Powerplant

- Enter make, model and serial number in the same manner as for aircraft.

c) Propeller

- Enter make, model, and serial number.

Note. Serial numbers are especially important for propeller problems. Combinations of propellers and engines sometimes cause problems therefore enter complete information.

(8) Phase of Operation/Maintenance

Enter the stage of flight or ground operation the aircraft was engaged in when the reported failure, malfunction, or defect occurred or was observed.

(9) System/Component

When a system or component report is being processed for a repair shop and it is not known what aircraft, powerplant or propeller it was removed from, "Component Only" should be written across block 8. Block 8 should be completed for all systems/components if possible.

INSTRUCTIONS FOR COMPLETING SAMPLE FORM (Cont'd.....)

(10) Specific Part (of Component) Causing Trouble

- Name: Enter the manufacturer's name of the specific part causing the problem.
- Number: Enter the manufacturer's part number.
- Part/Defect Location: Locate the discrepant part or the defect. Example rt. rear box, jacking point, left outboard, etc.

(11) Submitted by

Tick as appropriate and enter the name of the person submitting the report in section 17 of the form and the organization such as BWIA, Delta, XYZ Repair Station, etc.

(12) ATA Code

Enter the aircraft system and subsystem, respectively by the numerical symbols (ATA Spec 100) example engine cylinder 7230 enter only 7230.

(13) Part TT

Enter the total service time of the part in whole hours.

(14) Part TSO

Part time since overhaul; enter the service time of the part since it was last overhauled in hours example 316.3 hours.

(15) Part Condition

Enter the words which best describe the part condition such as broken, chafed, cracked, corroded, etc.

(16) Comments

The text should identify and describe the cause of the malfunction, failure or defect. It should contain descriptive information concerning the part/component that caused the difficulty, inspection findings and corrective action taken to prevent recurrence. If additional space is required to give the complete story use the reverse side of the form. Make reference to any attachment such as pictures, parts, etc.

(17) Information on the reporter

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APPENDIX C

LIST OF OCCURRENCES REQUIRED TO BE REPORTED

Introduction

1. (1) The objectives of occurrence reporting are shown at paragraph 8 of this TAC. Reporters should ensure that the content of their reports meets the criteria and guidance laid out below. Particular emphasis should be paid to ensuring that day to day operational anomalies, technical defects and routine reliability issues are dealt with via the normal organizational systems and procedures.

(2) The reporting of failures, malfunctions and defects and other occurrences which cause or might cause adverse effects on the continued airworthiness of aircraft as required by TTCAR No.3:76(2)(c) and No.5:22 must also be reported on the SDR form TF-040 as outlined at Appendix B.

(3) This Appendix lists the types of occurrence which, in the view of the TTCAA, are likely to fall within the definition of a reportable occurrence in which case they must therefore be reported. Whilst the Appendix lists the majority of occurrences which shall normally be reported it cannot be completely comprehensive and any other occurrences judged, by those involved, to meet the criteria should be reported.

(4) Practical and effective working of an Occurrence Reporting Scheme requires a constructive approach and resolve on the part of all reporters and others involved to make the Scheme a successful and worthwhile safety reporting programme.

(5) In the case of organizations providing a service or facility for aircraft operating over or in Trinidad and Tobago, (e.g. Air Traffic Services, aerodromes etc.) any occurrence meeting the required criteria should be reported regardless of the nationality of the aircraft involved

Aircraft Flight Operations

2. (1) The following should be reported by Flight Crew:

(a) Control of the Aircraft:

- (i) Rejected take-off resulting from or producing a hazardous or potentially hazardous situation (e.g. at speeds close to, or above, V1);
- (ii) Go around producing a hazardous or potentially hazardous situation;
- (iii) Unintentional significant deviation from intended track or altitude (more than 300 ft), caused by a procedural, systems or equipment defect or human factor;
- (iv) Descent below decision height/altitude or minimum descent height/altitude in instrument landing conditions;
- (v) Heavy landing, a landing deemed to require a 'heavy landing check';
- (vi) Unintentional contact with the ground, including touching down before the runway threshold;
- (vii) Over-running the ends or sides of the defined runway or landing strip;
- (viii) Significant inadvertent reduction in airspeed;
- (ix) Significant loss of control from any cause;
- (x) Approach to, landing on, lining up on or taking off from a wrong runway or airfield;

- (xi) Occurrence of a 'stick push' operation, other than for training or test purposes;
- (xii) Operation of any primary warning system associated with manoeuvring of the aircraft e.g. configuration warning, stall warning (stick shake), over speed warning etc. unless –
 - (A) The crew conclusively established that the indication was false, at the time it occurred, or
 - (B) The indication is confirmed as false immediately after landing provided that, in either case, the false warning did not result in difficulty or hazard arising from the crew response to the warning;
- (xiii) Reversion to manual control of powered primary controls, other than for training or test purposes;
- (xiv) Loss or malfunctioning of any rotorcraft AUTO stabiliser mode;
- (xv) Inadvertent incorrect operation of any controls which resulted in, or could have resulted in, a significant hazard;
- (xvi) A hazard or potential hazard which arises as a consequence of any deliberate simulation of failure conditions for training, system checks or test purposes;
- (xvii) In flight fuel quantity critically low or exhausted;
- (xviii) Significant fuel imbalance;
- (xix) Incorrect setting of an SSR code;
- (xx) Incorrect setting of an altimeter sub-scale;
- (xxi) Significant incorrect programming of navigation equipment;
- (xxii) Flight at a level, or on a route, different from that allocated;
- (xxiii) Incorrect receipt or interpretation of RTF messages which resulted in, or could have resulted in, a significant hazard;
- (xxiv) GPWS 'warning' when-
 - (A) The aircraft comes into closer proximity to the ground than had been planned or anticipated; or
 - (B) The warning is experienced in IMC or at night and is established as having been triggered by a high rate of; or
 - (C) The warning results from failure to select landing gear or land flap by the appropriate point on the approach; or
 - (D) Any difficulty or hazard arises or might have arisen as a result of crew response to the 'warning' e.g. possible reduced separation from other traffic. This could include warning of any Mode or Type i.e. genuine, nuisance or false;
- (xxv) GPWS 'alert' when any difficulty or hazard arises, or might have arisen, as a result of crew response to the 'alert';
- (xxvi) ACAS Resolution Advisory except for an "unnecessary alert", e.g. when triggered by a high rate of climb/descent but standard separation not compromised;
- (xxvii) Repetitive arising at an excessive frequency of a specific type of occurrence which in isolation would not be considered 'Reportable', e.g. a high frequency of -

- (A) Minor loading errors at a particular airfield;
- (B) GPWS nuisance warnings at a particular airfield;

Note: In such cases it is expected that the reporter will submit a single occurrence report together with the supporting evidence of high frequency and/or rate when it is considered that such a situation has been reached. Further reports should be submitted if the situation remains unchanged.

(b) Emergencies:

- (i) The use in flight or on the ground of any emergency equipment or prescribed emergency procedures in order to deal with a situation;
- (ii) The use of any non-standard procedure adopted by the flight crew to deal with an emergency;
- (iii) The declaration of an emergency, ('MAYDAY' or 'PAN');
- (iv) An emergency, forced or precautionary landing;
- (v) Failure of any emergency equipment or procedures to perform satisfactorily including when being used for training or test purposes;

(c) Crew Incapacitation:

- (i) Incapacitation of any member of the flight deck operating crew, including that which occurs prior to departure if it is considered that it could have resulted in incapacitation after take-off;
- (ii) Incapacitation of any member of the cabin crew which renders him unable to perform essential emergency duties;

(d) Injury. Any significant injury to any person which directly results from the operation of the aircraft or its equipment but which is not considered to constitute a reportable accident;

(e) Other Incidents:

- (i) A lightning strike which resulted in significant damage to the aircraft or the loss or malfunction of any essential service;
- (ii) A hail strike which resulted in significant damage to the aircraft or the loss or malfunction of any essential service;
- (iii) A bomb threat;
- (iv) A hijack;

Note: Other Security occurrences may require to be reported separately.

- (v) Wake vortex encounter – an encounter resulting in significant handling difficulties;
- (vi) A bird strike which resulted in significant damage to the aircraft or the loss or malfunction of any essential service;
- (vii) Turbulence encounter – an encounter resulting in injury to occupants or deemed to require a 'turbulence check' of the aircraft.

Aircraft and Equipment – Failures, Malfunctions and Defects

3. (1) TTCAR No.3:76(2)(c) and No.5:22 require operators, Approved Maintenance Organizations, Air Traffic Controllers, pilots and holders of AMEL to report any faults, failures, malfunctions, defects or other occurrences which cause or might cause adverse effects on the continued airworthiness of the aircraft such as -

(2) Each operator should also report on Form TF-040 (see Appendix B), the occurrence or detection of each failure, malfunction or defect concerning at least the following :

- (a) Fires during flight and whether the related fire-warning system functioned properly;
- (b) Fires during flight not protected by a related fire-warning system;
- (c) False fire warning during flight;
- (d) An engine exhaust system that causes damage during flight to the engine, adjacent structure, equipment, or components;
- (e) An aircraft component that causes accumulation or circulation of smoke, vapour, or toxic or noxious fumes in the crew compartment or passenger cabin during flight;
- (f) Engine shutdown during flight because of flameout;
- (g) Engine shutdown during flight when external damage to the engine or aircraft structure occurs;
- (h) Engine shutdown during flight due to foreign object ingestion or icing;
- (i) Shutdown during flight of more than one engine;
- (j) A propeller feathering system or ability of the system to control over-speed during flight;
- (k) A fuel or fuel-dumping system that affects fuel flow or causes hazardous leakage during flight;
- (l) A landing gear extension or retraction, or opening or closing of landing gear doors during flight;
- (m) Brake system components that result in loss of brake actuating force when the aircraft is in motion on the ground;
- (n) Aircraft structure that requires major repair;
- (o) Cracks, permanent deformation, or corrosion of aircraft structure, if more than the maximum acceptable to the manufacturer or the TTCAA;
- (p) Aircraft components or systems that result in taking emergency actions during flight (except action to shut down an engine);
- (q) Each interruption to a flight, unscheduled change of aircraft en route, or unscheduled stop or diversion from a route, caused by known or suspected mechanical difficulties or malfunctions;
- (r) Any abnormal vibration or buffeting caused by a structural or system malfunction, defect or failure;
- (s) A failure or malfunction or more than one attitude, airspeed or altitude instrument during a given operation of the aircraft;
- (t) The number of engines removed prematurely because of malfunction, failure or defect, listed by make and model and the aircraft type in which it was installed; and
- (u) The number of propeller featherings in flight, listed by type of propeller and engine and aircraft on which it was installed.

(3) In addition to the reports required above, each operator should report any other failure, malfunction or defect in an aircraft that occurs or is detected at any time, if in his opinion, the failure, malfunction or defect has endangered or may endanger the safe operation of the aircraft.

(4) The Service Difficulty Reports required of the operator in TTCAR No.3:76(2)(c) and No.5:22 and Appendix B -should be submitted in writing to the Authority on a daily basis.

Ground Services, Facilities or Equipment

4. (1) The following should be reported as indicated:

(a) Air Traffic Control Services -

- (i) Provision of significantly incorrect, inadequate or misleading information from any ground sources, e.g. ATC, ATIS, Meteorological Services, maps, charts, manuals, etc.;
- (ii) Provision of less than prescribed terrain clearance;
- (iii) Provision of incorrect altimeter setting;
- (iv) Misidentification of aircraft by an ATCO or radar operator;
- (v) Incorrect transmission, receipt or interpretation of significant messages;
- (vi) Airprox and any occurrence in which separation between aircraft is less than that prescribed for the situation;
- (vii) Non-compliance with prescribed let-down or departure procedures or any ATC/ ATM instruction;
- (viii) Declaration of an emergency ('MAYDAY' or 'Pan') by an aircraft;
- (viii) Unauthorised infringement of any form of regulated airspace;
- (x) Unauthorised or illegal RTF transmissions;
- (xi) ATC Overload reports;
- (xii) Declaration of an ACAS Resolution Advisory by an aircraft;

(b) Navigation and Communications Equipment etc. – failures, malfunctions or defects -

- (i) Total failure of navigation system or subsystem being used by an aircraft;
- (ii) Total failure of communications system;
- (iii) Total failure of radar system or subsystem;
- (iv) Failure or unplanned shutdown of a major operational ATC computer system requiring reversion to manual back up and resulting in disruption to the normal flow of air traffic;
- (v) Significant malfunction or deterioration of Service;
- (vi) Significant deficiency in maintenance;
- (vii) Repetitive events of a specific type of occurrence which in isolation may not be considered reportable (e.g. excessive monitor alarms);
- (viii) Provision of erroneous information in the absence of any alarms;

(c) Airfields and Airfield Facilities -

- (i) Failure or significant malfunction of airfield lighting;
- (ii) Major failure or significant deterioration of surfaces of runways or aircraft manoeuvring areas;

- (iii) Runways or aircraft manoeuvring areas obstructed by aircraft, vehicles or foreign objects, resulting in a hazardous or potentially hazardous situation;
 - (iv) Runway incursions;
 - (v) Errors or inadequacies in marking of obstructions or hazards on runway or aircraft manoeuvring areas;
 - (vi) Collision between a moving aircraft and any other aircraft, vehicle or other ground object;
 - (vii) Aircraft departing from a paved surface which results in, or could have resulted in, a significant hazard;
 - (viii) Jet or prop blast incidents resulting in significant damage or serious injury;
 - (ix) Significant spillage of fuel on airfield ramps;
- (d) Passengers/Baggage/Cargo -**
- (i) Difficulty in controlling intoxicated, violent or armed passengers;
 - (ii) Incorrect loading of passengers, baggage or cargo, likely to have a significant effect on aircraft weight and balance;
 - (iii) Incorrect stowage of baggage or cargo likely in any way to hazard the aircraft, its equipment or occupants or to impede emergency evacuation (includes hand baggage);
 - (iv) Inadequate storing of cargo containers or substantial items of cargo;
 - (v) Significant contamination of aircraft structure, systems or equipment arising from the carriage of baggage or cargo;
 - (vi) Presence of a stowaway(s);
- (e) Aircraft Ground Handling/Servicing -**
- (i) Loading of incorrect fuel quantities likely to have a significant effect on aircraft endurance, performance, balance or structural strength;
 - (ii) Loading of contaminated or incorrect type of fuel or other essential aircraft fluids (includes oxygen and potable water);
 - (iii) Significant spillage of fuel;
 - (iv) Failure, malfunction or defect of ground equipment used for test/check of aircraft systems and equipment when the required routine inspection and test procedures did not clearly identify the problem before safe operation of the aircraft could have been affected;
 - (v) Non compliance or significant errors in compliance with required maintenance/servicing procedures;
- (f) Ground Staff Incapacitation -** When an aircraft was, or could have been, endangered by the impairment of any member of ground staff (e.g. Aircraft Maintenance Staff, Air Traffic Controllers, Air Traffic Services Maintenance Staff, Airfield Support Staff etc.);
- (g)** Any other occurrence of any type considered to have endangered, or which might have endangered, the aircraft or its occupants.

APPENDIX D

OCCURRENCE REPORT

														ORGANIZATION REF NO.		TTCAA OCCURRENCE NO.											
1. FLIGHT CREW REPORT																											
AIRCRAFT TYPE & SERIES				REGISTRATION				OPERATOR				DATE				LOCATION/POSITION/RW				CAPTAIN				CO-PILOT			
FLIGHT NR				ROUTE				TIME (UTC):				FLIGHT LEVEL/ALT (FT)				IAS				ETOPS							
				FROM:				TO:				DAY/NIGHT/TWILIGHT								YES		NO					
NATURE OF FLIGHT		PAX	FREIGHT	POSITIONING	FERRY	TEST	TRAINING	BUSINESS	AGRICULTURAL	SURVEY	PLEASURE	CLUBGROUP	PRIVATE	PARACHUTING	TOWING												
FLIGHT PHASE		PARKED	TAXYING	TAKEOFF	INITIAL CLIMB	CLIMB	CRUISE	DESCENT	HOLDING	APPROACH	LANDING	CIRCUIT	AEROBATICS	HOVER													
ENVIRONMENTAL DETAILS																											
WIND				CLOUD				PRECIPITATION				OTHER METEOROLOGICAL CONDITIONS								RUNWAY STATE							
DIRN	SPEED (kts)	TYPE	HT (ft)	8th	RAIN	SNOW	SLEET	HAIL	VISIBILITY	ICING	MOD	SEVERE	TURBULENCE	MOD	SEVERE	OAT (C)	DRY	WET	ICE	SNOW	SLUSH						
					LIGHT		MODERATE	HEAVY	KM/M	LIGHT			LIGHT														
																CATEGORY		I	II	III							
BRIEF TITLE																											
2. DESCRIPTION OF OCCURRENCE (To be used for all occurrences reported on this form)																											
<i>Use additional form if required, <input type="checkbox"/> Tick here if additional form used</i>																											
Results of subsequent investigation																											
<i>Tick here <input type="checkbox"/> if Part 4 includes action taken to avoid recurrence</i>																											
Any procedures, manuals, publications, (e.g. AIC, AD, SB, etc) directly relevant to occurrence and compliance state of aircraft, equipment or documentation																											
ORGANIZATION				NAME				POSITION				SIGNATURE				DATE											
3. GROUND STAFF REPORT																											
A/C SERIAL NUMBER				ENGINE TYPE/SERIES				ETOPS APPROVED				GROUND				AIRCRAFT BELOW 5700KG ONLY – MAINTENANCE ORGANIZATION ETOPS APPROVED											
								YES				NO				MAINTENANCE											
																GROUND HANDLING											
																UNATTENDED											
																TEL NO											
COMPONENT/PART				MANUFACTURER				PART NR				SERIAL NR				MANUAL REF				COMPONENT OH/REPAIR ORGANIZATION							
UTILISATION - AIRCRAFT										UTILISATION - ENGINE/COMPONENT										MANUFACTURER ADVISED							
TOTAL		SINCE OH/REPAIR		SINCE INSPECTION		HOURS		TOTAL		SINCE OH/REPAIR		SINCE INSPECTION		YES		NO											
HOURS																											
CYCLES						CYCLES																					
LANDINGS						LANDINGS																					

TTCAA Form TF-053

4. REPORTING ORGANIZATION – REPORT

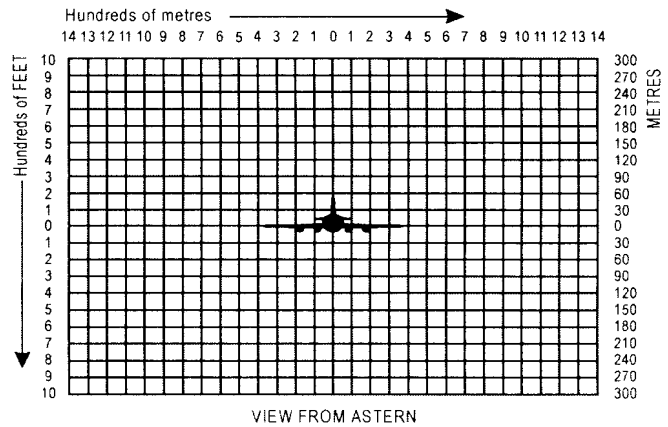
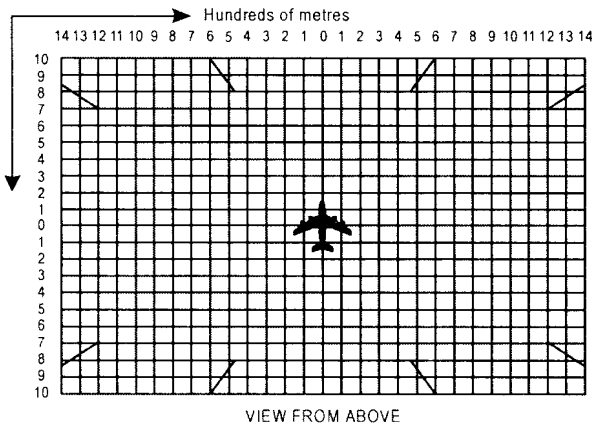
ORGANIZATION COMMENTS – ASSESSMENT/

ACTION TAKEN/SUGGESTIONS TO PREVENT RECURRENCE

ORGANIZATION	TEL/FAX	REPORTERS REF	REPORT		REPORTERS INVESTIGATION				FDR DATA RETAINED	
			NEW	SUPPL	NIL	CLOSED	OPEN		YES	NO
NAME	POSITION	SIGNATURE				DATE				

5. AIRMISS/ATC INCIDENT (DELETE AS APPLICABLE) and/or TCAS RA

Mark passage of other aircraft relative to you, in plan on the left and in elevation on the right, assuming YOU are at the centre of each diagram indicate appropriate scale.



HDG/RTE	°	TAS	FL/ALT SETTING	ATC INSTRUCTIONS ISSUED	CALLSIGN	FREQUENCY IN USE	HEADING	CLEARED ALTITUDE	MINIMUM VERTICAL SEPARATION	MINIMUM HORIZONTAL SEPARATION	
FROM:		TO:		YES NO			°		FT	M/NM	
CLIMB/DESCENT: LEVEL <input type="checkbox"/>	CLIMBING <input type="checkbox"/>	DESCENDING <input type="checkbox"/>	BANK ANGLE: SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> STEEP <input type="checkbox"/>			DETAILS OF OTHER AIRCRAFT					
TCAS ALERT	TYPE OF RA	RA FOLLOWED	WAS TCAS ALERT USEFUL	AVOIDING ACTION TAKEN	TYPE	MARKINGS	COLOUR	LIGHTING	CALLSIGN	ATTITUDE	AVOIDING ACTION TAKEN
RA	TA	NONE	YES NO	YES NO	YES NO						YES NO
RESTRICTIONS TO VISIBILITY:		NONE <input type="checkbox"/>	SUNGLARE <input type="checkbox"/>	DIRTY WINDSCREEN <input type="checkbox"/>	WINDSCREEN PILLAR <input type="checkbox"/>	OTHER COCKPIT STRUCTURE <input type="checkbox"/>					

6 WAKE TURBULENCE

HEADING	TURNING		G/S POSITION		EXT C/L POSITION			CHANGE IN ATTITUDE			CHANGE IN ALTITUDE		ANY BUFFET		STICK SHAKE		
°	LEFT	RIGHT	NO	HIGH	LOW	LEFT	RIGHT	NO	PITCH	ROLL	YAW	°	FT	YES	NO	YES	NO
WHAT MADE YOU SUSPECT WAKE TURBULENCE																	
DESCRIBE ANY VERTICAL ACCELERATION																	
NAME	POSITION	SIGNATURE				DATE											

7. TTCAA REVIEW OF ACTION TAKEN BY ORGANIZATION

SUMMARY OF FOLLOW-UP ACTION BY TTCAA:		OPEN	
		CLOSED	
NAME OF INSPECTOR	SIGNATURE	DATE	RECORD ENTERED IN DB

TTCAA Form TF-053

APPENDIX D

GUIDANCE ON THE COMPLETION OF THE TTCAA OCCURRENCE REPORT FORM – TF-053

GENERAL

1. (1) Wherever possible reporters should complete all sections of the Form where the information requested is relevant to a specific occurrence. (Where any of the information requested is clearly not relevant it may be omitted, e.g. weather details when weather is not a factor.) The following general notes apply:

- (a) The first part of the form is the in-flight crew report. The individual boxes are mostly self-explanatory and should be completed with the required data or circled as appropriate to indicate the conditions relating to the occurrence. The ETOPS box should be ticked “YES” if the operator has ETOPS approval and the occurrence on an aircraft type subject to this approval;
- (b) Part 2 of the form is **Description of Occurrence** and this block should be completed for all occurrences reported by the form;
- (c) Part 3 is the **Ground Staff Report** section;
- (d) Part 4 is the **Reporting Organization Report** and the boxes at the bottom of this section are used with Part 3 to provide the supporting technical data;
- (e) Part 5 is for **Airman or ATC Incidents**;
- (f) Part 6 is completed for report on **Wake Turbulence**.
- (g) Part 7 is the TTCAA review.

(2) Evaluation and processing of reports is greatly facilitated if the reports are typewritten but it is appreciated that this may not always be possible in this case the report should be completed in black ink.

(3) **Part 1 – Flight Crew Report.** The following are brief notes against each block:

- (a) **Aircraft Type, Series and Operator.** To be completed for all occurrences involving an aircraft. Provides basic identification data.
- (b) **Flight and Route Details.** Relates to in-flight occurrences only. Provides flight data in support of the narrative.
- (c) The following “nature of flight” expressions are defined as follows:
 - (i) **Pax** – Passenger Flight
 - (ii) **Freight** – Flight carrying cargo or freight Flight under Class 1 or 6 Air Transport Licence or an exemption.
 - (iii) **Positioning** - Flight without revenue load to/from point of departure/arrival of revenue flight.
 - (iv) **Ferry** - Ferry for technical reasons without revenue load, e.g. 3-engine ferry to maintenance base.
 - (v) **Test** - Check of serviceability, issue or renewal of Airworthiness Certificate, experimental or development flying.

APPENDIX D

- (vi) **Training** - Training course or examination for any standard of licence or rating type training, continuation training.
 - (vii) **Business** - Carriage of company staff in aircraft owned or hired by a company.
 - (viii) **Agricultural** - Aerial application, crop spraying, top dressing, etc.
 - (ix) **Survey** - Aerial photographic or mapping survey.
 - (x) **Pleasure** - Commercial pleasure flying. e.g. sightseeing.
 - (xi) **Club/Group** - Flying other than training by members in a club or group aircraft.
 - (xii) **Private** - Other than club/group flying or training.
 - (xiii) **Parachuting** - Carriage of parachutists for the purpose of parachuting.
 - (xiv) **Towing** -Towing of gliders, banners, etc.
- (d) The flight phases listed on the report are defined as follows:
- (i) **Parked** - On ramp with flight crew on board.
 - (ii) **Taxying** - From commencement of moving (including pushback) to start of take-off run or from completion of landing run to terminal gate or point of stopping engines, whichever occurs later.
 - (iii) **Take-off** -Start of take-off run to lift-off.
 - (iv) **Init Climb** - Lift-off to a height of 1500 ft or aircraft 'clean-up' whichever occurs last.
 - (v) **Climb** - End of initial climb to top of climb.
 - (vi) **Cruise** -Top of climb to top of descent including en-route climb or descent.
 - (vii) **Descent** - Top of descent to a height of 1500 ft.
 - (viii) **Holding** - Flying to a set procedure at a point which intentionally delays the aircraft, usually according to a set procedure at a 'fix'.
 - (ix) **Approach** - A height of 1500 ft to threshold.
 - (x) **Landing** - Threshold to end of landing run.
 - (xi) **Circuit**- Flying to a set pattern in the vicinity of an airfield with intention of landing.
 - (xii) **Aerobatics** -Deliberate aerobatic manoeuvres, including spinning.
 - (xiii) **Hover** Airborne and stationary.
- (e) Environmental details include relevant information on wind, precipitation, other meteorological conditions and runway state as shown.

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(4) **Part 2. Description of Occurrence – relates to all occurrences.** This should be a clear and concise description of the occurrence, preferably starting with a brief title indicating the type of occurrence. The description should contain details of what happened or what was found; what immediate action was taken to contain the situation; any additional information, comments or recommendations which it is considered might assist subsequent assessment of the report and/or investigation. Wherever possible the description should be supported by the results of subsequent investigation and details of any action taken by the reporter's organization to avoid a recurrence.

(5) **Part 3 – Ground Staff Report.** This part relates to both in-flight and ground occurrences. It provides maintenance and technical data in support of the description of the occurrence. The ground phases listed in this Part are defined as follows:

- (a) Maintenance – Aircraft on maintenance, overhaul or repair;
- (b) Ground Handling – Movements of aircraft on the ground other than as defined in "Taxiing";
- (c) Unattended – Standing, with no personnel on board.
- (d) Aircraft or component times should be quoted in units most relevant to the occurrence or to the component function, e.g. flying hours/cycles/landings or a combination of each. Provision is also made for total times and times since overhaul, repair or inspection;

(6) **Part 4 – Reporting Organization Report.** This Part is used as follows:

- (a) To give the organization's assessment of the occurrence and action taken or recommended to avoid recurrence;
- (b) Information should be provided which allows for the identification of the existence of any such information or procedures (e.g. mandatory inspections, ADs, crew drills, etc) issued for the purpose of controlling or avoiding such or similar occurrences;
- (c) Where the contents of this section meet the criteria for a Service Difficulty Report, then Form TF-040 must also be completed and distributed as required by TTCAR No.5:22.

(7) **Part 5 – Airmiss/ATC Incident Report.** This section is used by flight crew to report ATC incidents and is self explanatory.

(8) **Part 6 – Wake Turbulence.** This section is used by flight crew to report on wake turbulence encountered or suspected and is self explanatory.

(9) The reporter should enter the name of his organization where applicable, his position, name signature and date.

(10) **Part 7 – TTCAA Review of Action Taken by Organization.** The TTCAA will check the Reporting Organization, reporting and tick "Open" if the report requires TTCAA involvement and follow-up action. "Closed" will be ticked only when the TTCAA is satisfied that appropriate action has been taken to control the hazards. The 'Record entered on DB' will be ticked to show that the record has been entered.

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APPENDIX E SAMPLE

sample



Trinidad and Tobago
Civil Aviation Authority

BIRD STRIKE REPORTING FORM

Send to: **CIVIL AVIATION AUTHORITY
P.O. BOX 2163, NATIONAL MAIL CENTRE
PIARCO or INSPECTORATE OFFICE**

Operator	01/02	Effect on Flight	
Aircraft Make/Model	03/04	<i>None</i>	<input type="checkbox"/> 32
Engine Make/Model	05/06	<i>Aborted take-off</i>	<input type="checkbox"/> 33
Aircraft Registration	07	<i>Precautionary landing</i>	<input type="checkbox"/> 34
Date: day.....month.....year.....	08	<i>Engines shut down</i>	<input type="checkbox"/> 35
Local Time	09	<i>Other (specify)</i>	<input type="checkbox"/> 36
dawn <input type="checkbox"/> A day <input type="checkbox"/> B dusk <input type="checkbox"/> C night <input type="checkbox"/> D	10	Sky condition 37	
Aerodrome Name	11/12	<i>No cloud</i>	<input type="checkbox"/> A
Runway Used	13	<i>Some cloud</i>	<input type="checkbox"/> B
Location if En Route	14	<i>Overcast</i>	<input type="checkbox"/> C
Height AGL ft 15		Precipitation	
Speed (IAS) kt 16		<i>Fog</i>	<input type="checkbox"/> 38
Phase of Flight 17		<i>Rain</i>	<input type="checkbox"/> 39
<i>parked</i> <input type="checkbox"/> A <i>en route</i> <input type="checkbox"/> E		<i>Snow</i>	<input type="checkbox"/> 40
<i>taxi</i> <input type="checkbox"/> B <i>descent</i> <input type="checkbox"/> F		Bird species	41
<i>take-off run</i> <input type="checkbox"/> C <i>approach</i> <input type="checkbox"/> G		Number of Birds	
<i>climb</i> <input type="checkbox"/> D <i>landing roll</i> <input type="checkbox"/> H		Seen 42	Struck 43
Part(s) of Aircraft		1 <input type="checkbox"/> A	<input type="checkbox"/> A
<i>radome</i> <input type="checkbox"/>	Struck	2-10 <input type="checkbox"/> B	<input type="checkbox"/> B
<i>Windshield</i> <input type="checkbox"/>	Damaged	11-100 <input type="checkbox"/> C	<input type="checkbox"/> C
<i>Rose (excluding above)</i> <input type="checkbox"/>	18 <input type="checkbox"/>	more <input type="checkbox"/> D	<input type="checkbox"/> D
<i>Engine no. 1</i> <input type="checkbox"/>	19 <input type="checkbox"/>	Size of Bird 44	
<i>2</i> <input type="checkbox"/>	20 <input type="checkbox"/>	<i>small</i>	<input type="checkbox"/> S
<i>3</i> <input type="checkbox"/>	21 <input type="checkbox"/>	<i>medium</i>	<input type="checkbox"/> M
<i>4</i> <input type="checkbox"/>	22 <input type="checkbox"/>	<i>large</i>	<input type="checkbox"/> L
<i>propeller</i> <input type="checkbox"/>	23 <input type="checkbox"/>	Pilot Warned of Birds 45	
<i>wing/rotor</i> <input type="checkbox"/>	24 <input type="checkbox"/>	Yes <input type="checkbox"/> Y No <input type="checkbox"/> X	
<i>fuselage</i> <input type="checkbox"/>	25 <input type="checkbox"/>	Remarks (<i>describe damage, injuries and</i>	
<i>landing gear</i> <input type="checkbox"/>	26 <input type="checkbox"/>	<i>other pertinent information</i>)	46/47
<i>tail</i> <input type="checkbox"/>	27 <input type="checkbox"/>	
<i>lights</i> <input type="checkbox"/>	28 <input type="checkbox"/>	
<i>other (specify)</i> <input type="checkbox"/>	29 <input type="checkbox"/>	
	30 <input type="checkbox"/>	
	31 <input type="checkbox"/>	
Reported by		Contactable at	

THIS INFORMATION IS REQUIRED FOR AVIATION SAFETY

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Form TF-065

Description of the occurrence (continuation):

sample

Signature: _____

Date: _____

Note:

1. Any type of dangerous goods occurrence must be reported, irrespective of whether the dangerous goods are contained in cargo, mail or baggage.
2. A dangerous goods accident is an occurrence associated with and related to the transport of dangerous goods which results in fatal or serious injury to a person or major property damage. A dangerous goods accident may also be an aircraft accident; in which case the normal procedure for dangerous goods accidents must be followed.
3. A dangerous goods incident is an occurrence, other than a dangerous goods accident, associated with and related to the transport of dangerous goods, not necessarily occurring on board an aircraft, which results in injury to a person, property damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packing has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardizes the aircraft or its occupants is also deemed to constitute a dangerous goods incident.
4. This form may also be used to report any occasion when undeclared or misdeclared dangerous goods are discovered in cargo or when baggage contains dangerous goods which passengers are not permitted to take on board aircraft.
5. An initial report should be dispatched within 72 hours of the occurrence, unless exceptional circumstances prevent this. The initial report may be made by any means but a written report should be sent as soon as possible, even if all the information is not available.
6. Completed reports are normally sent to the competent authority.
7. Copies of all relevant documents should be included with the report.
8. Providing it is safe to do so, all dangerous goods, packagings, documents etc, relating to the occurrence must be retained until after the initial report has been made.
9. Requirements and procedures differ from state to state; it is therefore recommended that the local competent authority be contacted in order to clarify the exact procedures to be followed in the event of a dangerous goods occurrence.

APPENDIX G

The following table provides examples of flight data monitoring and analysis events that may be further developed using operator and aircraft specific limits. The table is considered illustrative and not exhaustive.

Event Group	Description
Rejected take-Off	High Speed Rejected take-off
Take-off Pitch	Pitch rate high on take-off Pitch attitude high during take-off
Unstick Speeds	Unstick speed high Unstick speed low
Height Loss in Climb-out	Initial climb height loss 20 ft AGL to 400 ft AAL Initial climb height loss 400 ft to 1 500 ft AAL
Slow Climb-out	Excessive time to 1 000 ft AAL after take-off
Climb-out Speeds	Climb out speed high below 400 ft AAL Climb out speed high 400 ft AAL to 1 000 ft AAL Climb out speed low 35 ft AGL to 400 ft AAL Climb out speed low 400 ft AAL to 1 500 ft AAL
High Rate of Descent	High rate of descent below 2 000 ft AGL
Go-around	Go-around below 1 000 ft AAL Go-around above 1 000 ft AAL
Low Approach	Low on approach
Glideslope	Deviation under glideslope Deviation above glideslope (below 600 ft AGL)
Approach Power	Low power on approach
Approach Speeds	Approach speed high within 90 sec of touchdown Approach speed high below 500 ft AAL Approach speed high below 50 ft AGL Approach speed low within 2 minutes of touchdown
Landing Flap	Late land flap (not in position below 500 ft AAL) Reduced flap landing Flap load relief system operation
Landing Pitch	Pitch attitude high on landing Pitch attitude low on landing
Bank Angles	Excessive bank below 100 ft AGL Excessive bank 100 ft AGL to 500 ft AAL Excessive bank above 500 ft AGL Excessive bank near ground (below 20 ft AGL)
Normal Acceleration	High normal acceleration on ground High normal acceleration in flight flaps up (+/- increment) High normal acceleration in flight flaps down(+/- increment) High normal acceleration at landing
Abnormal Configuration	Take-off configuration warning Early configuration change after take-off (flap) Speed brake with flap Speedbrake on approach below 800 ft AAL Speedbrake not armed below 800 ft AAL
Ground Proximity Warning	GPWS operation - hard warning GPWS operation - soft warning GPWS operation - windshear warning GPWS operation - false warning
TCAS Warning	TCAS operation – Resolution Advisory

APPENDIX G

Event Group	Description
Margin to Stall/Buffer	Stickshake False stickshake Reduced lift margin except near ground Reduced lift margin at take-off Low buffet margin (above 20 000 ft)
Flight Manual Limitations	Vmo exceedence Mmo exceedence Flap placard speed exceedence Gear down speed exceedence Gear selection up/down speed exceedence Flap/ Slat altitude exceedence Maximum operating altitude exceedence