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GUIDELIES FOR THE USE OF TCAS II IN THE CURACAO FIR (TNCF)

1. Introduction

- 1.1** Evaluation of the Traffic Alert and Collision Avoidance System TCAS II is being conducted as a worldwide program under the aegis of the International Civil Aviation Organization (ICAO). Several problems have been identified and are subject of continuous monitoring but the need to assure the compatibility of operation of airborne collision avoidance system with the provision of separation by ATC is an issue which is receiving special attention. The evaluation has already provided data which are expected to lead to some modification of the system's collision avoidance logic. Consequent reduction in the rates of Traffic Advisories and Resolution Advisories is expected to improve compatibility with ATC procedures. Those aircraft operators who have fitted or intend to fit their aircraft with TCAS systems are therefore encouraged to install the latest version approved by the appropriate certification authorities.
- 1.2** The purpose of this circular is to provide guidelines and advice on the operation of TCAS II and on the use of Traffic Advisory and Resolution Advisory indications which it may generate. Compliance with the provision in this circular will improve operating procedures by pilots and controllers. The procedures described below should therefore be applied immediately by controllers and pilots.

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2. Collision avoidance procedures

2.1. The ICAO provisions concerning the use of Airborne Collision Avoidance System indications are contained in PANS-OPS (Doc 8168) Volume 1 and in PANS RAC (Doc 4444) Part II, paragraph 18. Pilots should comply with the operation procedures approved by the appropriate authority, in conformity with these provisions.

2.2 In applying the procedures, the following aspects are emphasized:

2.2.1 Traffic Advisories

Pilots should not attempt to maneuver solely on the basis of Traffic Advisory information

TCAS II is not capable of accurately resolving the bearing or heading of conflicting traffic. In addition, the Traffic Advisory displayed information of conflicting traffic vertical rate is not sufficiently accurate to permit vertical avoidance maneuvers to be performed. Traffic Advisory information may however be used to assist positive visual identification of conflicting traffic and to warn the pilot that a threat to safety may exist.

2.2.2 Resolution Advisories

- a) All resolution advisories (corrective or preventive) should be followed unless the pilot can visually identify the conflicting traffic and decide that no deviation from the current flight path is needed. When subsequently the Resolution Advisory changes, the pilot should again respond promptly in compliance with the indications. Failure to comply with a resolution advisory can result in a less than desired vertical miss distance at the closest point of approach.
- b) Vertical speeds greater than those demanded by a Resolution Advisory should be avoided. This will reduce the likelihood of excessive altitude deviation bringing the aircraft into conflict with others.
- c) If a decision is made not to follow a Resolution Advisory (corrective or preventive) a maneuver should never be made in a direction opposite to the one indicated by the Resolution Advisory. This is particularly important as the system may coordinate, unknown to the pilot, with another equipped aircraft.
- d) Recovery maneuvers to resume the assigned ATC clearance should be initiated immediately after the system annunciates "clear of conflict".

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3. Responsibility for separation of aircraft during maneuvers in compliance with a resolution advisory.

- 3.1** The use of TCAS II does not alter the respective responsibilities of pilots and controllers for the safe operation of aircraft. On being notified that an aircraft under air traffic control is maneuvering in accordance with a Resolution Advisory, a controller should not issue instructions to that aircraft which are contrary to the Resolution Advisory, as communicated by the pilot. Once an aircraft departs from an assigned ATC clearance in compliance with a Resolution Advisory, the controller ceases to be responsible for providing separation between that aircraft and other aircraft affected as a direct consequence of the maneuver induced by the Resolution Advisory. However, when circumstances permit, the controller should endeavor to provide traffic information to aircraft affected by the maneuvers. The controller's responsibility for providing separation for all affected aircraft resumes when either:
- a) The controller acknowledges a report from the pilot that the aircraft has resumed its assigned clearance, or
 - b) The controller acknowledges a report from the pilot that the aircraft is resuming its assigned clearance and issues an alternative clearance which is acknowledged by the pilot.

4. Radiotelephony reporting procedures.

- 4.1** The ICAO provisions already approved do not yet address the verbal exchange which needs to take place between pilots and controllers in relation to the use of airborne collision avoidance systems. Work concerning unambiguous reporting phraseology is being actively pursued in order to provide pilots and controllers with a mutual understanding of the maneuvers in progress. It is considered essential that the relevant phraseology is agreed for worldwide application before regional implementation can take place.
- 4.2** No particular reference to the TCAS system should be made in a possible request for traffic information following a Traffic Advisory. Such requests should be kept to the strict minimum and should be limited to potential threats which cannot be seen and give cause for concern.

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- 4.3** A Resolution Advisory should be notified to the ATC unit only when a maneuver induced by the system leads the pilot to deviate from the assigned clearance. The pilot should notify the controller of the direction given by the resolution advisory and then of its termination. However, there is no requirement for the pilot to notify the controller prior to responding to a Resolution Advisory.
- 4.4** The reports to be made by the pilot when a Resolution Advisory induces a deviation from the ATC clearance should contain:
- Name of ATC Unit
 - Aircraft identification
 - Specific indication of deviation
- 4.5** Proposed Reporting Phraseologies
- The pilot should report the commencement of the maneuver, as soon as time and circumstances permit, as follows:
BRONCO 555 TCAS (pronounced as TEE KASS) CLIMB OR TCAS DESCENT

The controller should respond to the pilot as follows:
BRONCO 555 CONTROL ROGER
 - Depending on the circumstances, after the airborne collision avoidance system indicates "Clear of Conflict":
 - The pilot should report:
BRONCO 555 RETURNING TO ASSIGNED (level of clearance)
The controller should acknowledge such a report and may issue a revised clearance.
or, alternatively
 - When the aircraft has resumed its assigned clearance, the pilot should report:
BRONCO 555 ASSIGNED (level of clearance) RESUMED
The controller should acknowledge such a report.

Note: the term TCAS is chosen for reasons of phonetic clarity in radiotelephony exchanges.