

**Comments are invited on these proposed changes to CAP 670, Part C, Section 3 SUR 10. This Section has been revised and should be read in its entirety.**

## **SUR 10 Requirements for the Recording, Retention and Replay of ATS Surveillance Data**

### **Part 1 Preliminary Material**

#### **1 Introduction**

- 1.1 The ability to replay recordings of ATS surveillance data is a vital aid to post accident or post incident investigation and to provide location data in the event of search and rescue operations.
- 1.2 Replayed data can also be used to evaluate and maintain the performance of surveillance systems used to aid the provision of an air traffic service.

#### **2 Scope**

- 2.1 The term “surveillance data” mentioned in this document refers to all surveillance data obtained from third party providers, en-route or airfield sensors (including approach and surface movement sensors) by radar or other surveillance techniques such as Automatic Dependant Surveillance (ADS) or multi-lateration and wherever such data is used as an aid to air traffic services.

**NOTE:** The ICAO Standard for “Automatic recording of surveillance data”, set out in paragraph 6.4.1 of Chapter 6 in Annex 11 “Air Traffic Services” (Thirteenth Edition, Amendment 43), requires the automatic recording of “surveillance data from primary and secondary radar equipment or other systems (e.g. ADS-B, ADS-C) used as an aid to air traffic services”.

#### **3 General Requirements**

- 3.1 By 1 January 2012 all ATS Units which use surveillance data as an aid to air traffic services are required to have in place surveillance data recording systems for recording both operational screens “At The Glass” (ATG) and surveillance data obtained through the wall (TTW) together with the ability to provide a time synchronised replay of voice and surveillance data.

## Part 2 General Requirements

### 4 Safety Objective

To provide data for use in accident and incident investigations either by the Air Accidents Investigation Branch (AAIB) or CAA, and to support search and rescue, air traffic control and surveillance systems evaluation and training (1716).

### 5 Functional Requirements

- 5.1 All surveillance data used by an Air Navigation Service Provider (ANSP) for the purposes of providing an air traffic service shall be automatically recorded and retained by the surveillance data recording system for future replay if required.
- 5.2 Surveillance data used as an aid to air traffic services shall normally be recorded at two points in the path between the surveillance sensor(s) and the display system with the only exceptions being those described in Section 9 of this document.
- a) Through The Wall (TTW); Data obtained from remote or on site sensors or networks.
  - b) Operational Screens recorded “ATG”; from a connection (or “tap”) as close to each operational display as is practicable.
- 5.3 The surveillance data obtained “ATG” shall be recorded with no loss of accuracy or detail using a lossless compression technique. The recording system shall be capable of recording data at a rate (which may be adaptive) sufficient to ensure the successful capture of any changes that occur to the surveillance data displayed to the controller and any system input change made by the controller such as any entries made via either a keyboard or mouse/rolling ball.
- 5.4 The surveillance data recording system deployed at an ATS Unit shall not degrade or otherwise adversely affect the performance of the surveillance processing and display systems employed at that ATS Unit.
- 5.5 The surveillance data recording system and power supply configuration shall ensure the continued availability of the recording process, without interruption, whenever the ATS Unit is providing an air traffic service (see Section 11).
- 5.6 Surveillance data recorded either at the ATS Unit or by a third party provider (see Section 7) shall be retained in secure storage for a minimum period of thirty days or longer if the recordings are pertinent to the investigation of an air accident or incident (see Section 14).
- 5.7 The surveillance recording and replay system shall be capable of supporting the time-synchronised replay of voice and surveillance data recorded at the ATS Unit.

## Part 3 Specific Requirements

### 6 Recording of Data obtained “Through The Wall” (TTW)

- 6.1 Surveillance data provided to, or obtained by, an ATS Unit for the purposes of providing an air traffic service shall be recorded “through the wall”, i.e. data obtained from remote or on site sensors or networks with the exception of data used in the circumstances mentioned in section 7 (below) or in section 9.

### 7 Requirements for the Recording and Retention of Data Provided by Third Parties

- 7.1 In circumstances where surveillance data is sourced from a third party (e.g. NATS or MoD), and when the ANSP elects not to record data obtained through the wall (TTW) on their premises, ATS Units are reminded that they must obtain and submit to the relevant CAA Regional Office, evidence that the surveillance data used to support the provision of ATS will be recorded and retained by the provider of such data.

**NOTE:** This evidence should be in the form of a written agreement between the provider of the surveillance data and the ATS Unit.

### 8 Requirements to Enable and Support the Reconstruction of Aircraft Flight Paths

- 8.1 The AAIB, CAA or other investigating agency may need to reconstruct an aircraft flight path from surveillance data recorded and retained by the ATS Unit or third party provider.
- 8.2 Investigation and subsequent analysis of aircraft accidents is often assisted by data supplied in the form of the latitude and longitude of each target plus time relative to UTC and any additional data obtained from secondary replies.
- 8.3 This data cannot easily be derived from screen recordings so recordings of the original data returned from the surveillance sensor (or sensors) must also be retained by the ATS Unit or a third party provider, if the ATS Unit was using surveillance data derived from an external source.

### 9 Circumstances which only require “ATG” Recording

#### 9.1 Analogue Primary Radar Systems

- 9.1.1 Data from an analogue primary radar sensor presents an impractical recording requirement as regards bandwidth and subsequent storage of the recorded data.
- 9.1.2 In circumstances where the analogue radar data are displayed to the controller in the form of a processed and plot extracted signal, surveillance data shall be recorded from each operational screen “ATG”.

#### 9.2 Surface Movement Surveillance Systems

- 9.2.1 The requirements for recording surface movement surveillance data will be limited to those situations where tactical control decisions are based upon the information obtained from those systems.
- 9.2.2 Surface Movement control systems including SMR displays and A-SMGCS displays shall be recorded at the glass (ATG) where the information presented on these displays is used to provide guidance, information or instructions either by visual or non-visual means that would lead to any movement action of an aircraft or vehicle receiving the service.

### 9.3 Recording of Aerodrome Traffic Monitor (ATM) Displays

The Aerodrome Traffic Monitor displays shall be recorded “ATG” at all times where the ATM display is used to perform any functions listed in paragraph 17.2 of CAP 493 (MATS Part1) Section 2 Chapter 1 subject to conditions listed therein.

### 9.4 Recording of Spare Positions, Duplicate positions and surveillance data in Contingency Visual Control (CVCR) Rooms

9.4.1 Surveillance data provided for any spare positions, duplicate positions including those positions of any contingency visual control rooms shall be recorded “ATG” for the entire duration where surveillance data provided to such positions was used in support of air traffic services including approach or aerodrome control functions.

## 10 Accurate and Consistent Timing

10.1 The surveillance recording system shall include time-recording devices or techniques to ensure the accurate “time-stamping” of ATS data.

10.2 Time-recording devices or techniques shall use Co-ordinated Universal Time (UTC) and shall express each time-stamp in hours, minutes and seconds of the 24-hour day beginning at midnight (712).

10.3 A common time-source shall be used to ensure that all recordings made at an ATS Unit or those retained by a third party provider can be time-synchronised in accordance with the minimum requirements set out in paragraph 5.7 of this document.

10.4 The recorder time-source shall be automatically updated by reference to an international time standard such as the MSF signal radiated from Anthorn in Cumbria or be subject to regular and documented checks to ensure that the time-stamps are maintained within a tolerance of less than  $\pm 2$  seconds of UTC (713).

## 11 Data Integrity and Continuity of Recording

11.1 Surveillance recording must be maintained during operational hours and measures shall be in place in the event of a loss of a single “ATG” or “TTW” data recording capability to restore recording in a relatively short time (e.g. a spare screen capture device or moving to a spare position).

**NOTE:** It is likely that the provision of dual-redundant equipment or systems which contain multiple hard disc drives (HDD) or solid state drives (SSD), configured as Redundant Array of Independent Drives (RAID) will be necessary to achieve the required availability.

11.2 In the event of a total loss of “ATG” or “TTW” recording, the ANSP shall inform the appropriate Regional Office of the situation and take measures to reinstate the recording capability as soon as practicable.

11.3 The provision of a back-up power supply from either a central battery system or individual Un-interruptible Power Supply (UPS) unit shall ensure the continued availability of power to the surveillance recording system and other essential equipment in the event of an interruption to the main electrical supply (2261).

- 11.4 **Guidance:** The equipment configuration should take account of such factors as the hours of operation of the ATS Unit, and any provisions for maintenance/repair at the ATS Unit, including the ability to replay recorded data, and when needed, the ability to copy such data to removable media whilst continuing to record surveillance data.

## 12 Alarm/Status Indications

- 12.1 Local and remote alarm/status indications of the surveillance recording system, including any additional hardware associated with “screen capture” (“ATG”), shall be provided to alert Air Traffic Control and/or Engineering personnel to take such actions as are necessary to ensure the continued operation of the surveillance recording at the ATS Unit (985).
- 12.2 Remote alarm indications shall be “latching” so that they require positive intervention by ATC or Engineering staff and confirmation of the status of the surveillance recording system by those staff before the alarms are cancelled.
- 12.3 **Guidance:** Whilst it may be appropriate to be able to cancel an audible alarm, another independent visual signal or lamp should continue to alert ATC or Engineering staff until the necessary restorative action has been taken by these staff.

## 13 Serviceability and Recording Function Check

- 13.1 A daily check shall be made of the surveillance recording function. Alternatively the recording system shall contain automatic monitoring to alert the failure of the recording system by visual or audible alarms or indications.
- 13.2 **Guidance:** Use can be made of any devices or facilities incorporated into the recording equipment to perform automatic checks of the recording function but unless this check is made directly from the hard drive (or drives), a separate replay of pre-recorded data must be made (as determined by local procedures) and the result recorded in the Engineering log book.

## 14 Surveillance Data Storage Procedures

- 14.1 The recorded data shall be retained in secure storage and protected from being erased, corrupted or deleted for a period of at least thirty days.

**NOTE:** When the recordings are pertinent to accident and incident investigations, they shall be retained for longer periods until it is evident that they are no longer required (see Section 15).

- 14.2 Suitable measures and procedures at each ATS Unit shall ensure:

- a) All access to the stored data is recorded (728);
- b) Authority under which any recorded radar data leaves the site for replay or duplication is recorded (729); and
- c) The identity of the person or organisation taking charge of the recorded radar data is recorded (730).

**15 Impounding the Recorded Data**

- 15.1 The ATS Unit, or third party provider of surveillance data, will be permitted to retain one copy of the quarantined data for local use but data retained in the “quarantine” area of the surveillance data recorder must not be replayed, deleted or over-written until CAA written permission for the release of such data is received (725).

**16 Access to Original Records**

- 16.1 In the event that the AAIB request a visual replay of the recorded data (at either the ATS unit or third party provider), the ANSP must be able to provide that visual replay within 24 hours of receiving the request.
- 16.2 The ANSP shall ensure that appropriate requirements and guidance for ATS personnel are contained in their Manual of Air Traffic Services Part 2.

**17 Replay Functions and Facilities**

- 17.1 The use of replay and duplication functions provided by the surveillance recording system shall not cause a break in the recording (742).
- 17.2 ATS Units and third party providers shall be capable of providing a copy of aircraft track data recorded “through the wall” for specified dates and times upon request by either the AAIB or the CAA.
- 17.3 The ATS unit shall provide the extracted data as soon as possible but no later than 72 hours following the arrival of the request. The extracted data shall be provided in a format compatible with replay systems used by the CAA and the AAIB. If this is not possible, an appropriate replay tool shall be provided with the data.
- 17.4 The surveillance replay system shall also be capable of producing hard copy of the recorded aircraft tracks and this data shall be made available to either the AAIB or the CAA when required (743).

**18 Replay of Surveillance Data Recorded “ATG”**

- 18.1 Replay of the extracted and reconstructed data recorded “ATG” shall faithfully and correctly identify all of the features displayed at the relevant operational position at the time of screen capture.
- 18.2 The recorded data should be available for replay at a separate (non-operational) position either “on-demand”, or as soon as possible, in the case of a replay required to support “search and rescue”.
- 18.3 The ATS unit shall provide the recordings made using screen capture techniques as soon as possible but no later than 72 hours following the arrival of the request. The extracted data shall be provided in a format compatible with replay systems used by the CAA and the AAIB. If this is not possible, an appropriate replay tool shall be provided with the data.
- 18.4 Individual frames/shots, from a replay of data recorded “ATG” should also be capable of being output as a printed copy when required.