TENTH SESSION OF THE STATISTICS DIVISION

Montréal, 23 to 27 November 2009

Agenda Item 2: Air carrier traffic data and traffic flow statistics

STATUS OF INTEGRATED STATISTICAL DATABASE (ISDB) DEVELOPMENTS AND UPGRADES

(Presented by the Secretariat)

SUMMARY

In September 2002, the Organization implemented the new Integrated Statistical Database (ISDB) system to collect process and disseminate all the aviation statistics submitted by Contracting States through the ICAO Statistics Programme. This information paper gives a brief description of the main features of the new system as well as current developments aimed at improving the interface of this system with external users and, where possible, integrating into the ISDB other stand alone databases held in ICAO

1.   **INTRODUCTION**

1.1   In March 1999, the Council agreed to allocate funds to strengthen the ICAO Statistics Programme. The bulk of these funds were used to carry out the analysis and design of an integrated statistical database for ICAO based on the Oracle software. This task was completed by the end of October 2000.

1.2   On the basis of this work, in December 2000 the Council approved additional funds to carry out the development, testing and implementation of the new database which were graciously granted. Work on the development and implementation of the database began in June 2001 and the new Integrated Statistical Database (ISDB) of ICAO became fully operational in September 2002.

2.   **MAIN FEATURES OF THE NEW SYSTEM**[1]

2.1   As the new database is Web-enabled, ICAO Contracting States as well as regional civil aviation organizations such as the Arab Civil Aviation Commission (ACAC), the African Civil Aviation Commission (AFCAC), the European Civil Aviation Conference (ECAC) and the Latin American Civil Aviation Commission (LACAC), are able to access the data therein via the Internet, through a standard browser.

2.2   A main feature of the ISDB is the tracking system which follows each Air Transport Reporting Form, whether submitted on paper or in electronic form, from the moment it is due until it is finally loaded into the database. Even though the data reception, entry, analysis and validation appear as three distinct functions, these are intimately related to each other through the data tracking function. At the same time, the reference tables are an integral part of the verification of some of the identifiers (e.g. air carrier, State, currency, aircraft type, etc.) associated with the data during the data entry process.

2.3   In addition, at the beginning of each year, the tracking system is loaded with the information regarding the Air Transport Reporting Forms which each State is supposed to submit to ICAO and the deadlines for their submission. After pre-defined periods past the deadline have expired, the system automatically advises the State concerned by e-mail, facsimile or letter that certain Forms are past due.

2.4   Once the data have been entered and accepted by the system, they are placed in a temporary database where a number of quality control checks are carried out prior to finally loading the data into the ISDB. The new system carries out these checks within the same data set such as, for example, average aircraft speed, average stage length, average passenger weight, etc., for the air carrier traffic data; compares the data with previous submissions such as the previous month and/or previous year; as well as comparing across data sets, such as between the air carrier traffic and the on-flight origin and destination figures to ensure that the data are homogeneous. Where the system detects deviations or "errors" in the data submitted, these are reviewed by Secretariat staff and States or other reporting entities may be asked to provide clarification and, if necessary, resubmit data in amended form.

2.5   Access to the ISDB data is obtained through a data warehouse which is essentially a second database residing outside the ICAO Intranet. This architecture allows for the ISDB data to be accessible from outside of ICAO via the Internet while at the same time insulating the main database from potential security threats. The data warehouse contains summary tables that organize the data in ways that facilitate access to casual users and speed-up the querying process. These tables are generated on a periodic basis from the data contained in the ISDB. The tables which form the data warehouse represent the main data series and where necessary also include cross-referenced data to allow certain analyses to be carried out (e.g. the tables corresponding to the financial data where possible also have the corresponding traffic data). Additional data tables may be determined on the basis of the type of queries which are most often addressed to the system.

2.6   The staff of the Statistics Section can access the data warehouse using an analytical tool. This tool allows users to perform ad hoc queries against the data warehouse and carry out complex analyses. Experience with this tool has shown that users need to be very familiar with the data to ensure that the correct answer is obtained. Due to this reason, and mainly because of cost considerations, it was decided that at this stage other users within and outside ICAO will only have access to the data through

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[1] Extract from a working paper on the ISDB presented by the Secretariat to the Air Transport Committee (AT-WP/1940, 28 August 2002).

pre-set reports which will be available through a normal Internet browser. Having gained access to the appropriate site, these other users may then select a few of the elements required (e.g. time series, data parameter, entity or geographical area) to generate the appropriate report.

3.   **CURRENT AND PLANEED DEVELOPMENTS**

3.1   In 2008 some reports, which had to be left out of the original development due to shortage of funds, were added to the ISDB and its main functions reviewed and upgraded. The new reports available are:

a) airport Traffic (monthly and annual summary);

b) civil aircraft on register; and

c) the historical series of currency exchange rates.

3.2   In addition, in an effort to improve the data quality and range, as well as to facilitate the exchange of information between Contracting States and ICAO, several other developments are planned for the ISDB and the data warehouse. Listed below are the planned improvements that will impact internal and external users of the ISDB:

Electronic forms automatic input/validation/verification

3.3   A new method to input electronic Forms being proposed will ease and automate part of the input process. Under this new method, States would be able to input their information directly into the system. This will help to avoid common input errors, reduce processing time while at the same time it will enforce the standardization of input formats.

New civil aircraft on register database

3.4   The background and status of this database are discussed in STA/10-WP/8. The new database being developed at present is a standalone application. However, it is planned to integrate it with the ISDB to take advantage of the well-established processes available in the latter for the reception and management of information submitted by States. This centralization of information also will:

a) avoid the duplication of working processes currently being executed by ICAO and the national administrations of several Contracting States;

b) consolidate the information with regard to owners and operators; and

c) provide means to verify the registration of civil aircraft in accordance with the wishes of Contracting States.

Integration with other ICAO databases

3.5   In order to improve the presentation of the information available in ICAO and reduce duplication and database maintenance costs, the Organization should be working towards the integration of several internal databases, as agreed by the Air Transport Bureau (ATB), the Air Navigation Bureau (ANB), and the Information and Communication Technology Section (ICT) during the first internal

Database Workshop held in November 2008. The Workshop conclusion was that the ISDB would be the centre reference database for ICAO integrating several other already existing databases. This would allow States to have more comprehensive views regarding several aspects of aircraft characteristics and operations; airport and air carrier information; as well as their integration with the ICAO Designators for Aircraft Operating Agencies, Authorities and Services (Doc 8585) and the Location Indicators (Doc 7910) databases, among others. The taxonomy developed by the Commercial Aviation Safety Team (CAST) and ICAO for naming aircraft and aircraft engines in databases is to be enforced for all aircraft related information, improving the standardisation of data across the Organization and Contracting States.

3.6   Another important integration is that of the revenue cost analysis (RCA) system. The latter was developed by ICAO to assist in carrying out the studies on international air carrier operations in pursuance of relevant ICAO Assembly Resolutions (the present one is A36/15, Appendix G[2]). These studies generate for each of 17 international route groups and for different airline regional grouping within each route group, various traffic and financial estimates, such as passenger load factor, passenger revenues, revenue/cost ratio and total and average costs, including their breakdown into major cost categories.

3.7   The studies are based on two sets of information: a) an annual questionnaires sent by ICAO to all Contracting States; and b) an analysis of air carrier schedules supplied by OAG Aviation Solutions (previously known as Back Aviation Solutions). Both sets of information makes extensive use of the ISDB reference tables on airports, air carriers, states, and cities, to properly identify and classify the information received.

3.8   ICAO is currently re-engineering the RCA system in order to provide integration with the ISDB at the data level. It is also planned to review and redesign the processes and software underlying the preparation of the database for the conduct of the studies as well as the analytical phase of the studies. The redesign, coupled with the integration of the RCA system with the ISDB, will speed up the conduct of the studies by eliminating or improving certain manual processes and possibly simplifying and accelerating automated processes involved in the present system.

3.9   The re-engineering project is in its first of four planned phases. The first phase is scheduled to be completed during the fourth quarter of 2009. However, the implementation and scheduling of the remaining three phases of the project are conditional on when the necessary funds will become available.

3.10   Depending on the recommendations adopted by STA/10, there may be changes required to the tables which are currently in the ISDB. As yet no funds have been allocated for this; they will need to be taken into account when the programme budget for the next triennium 2011-2013 will be discussed in Council.

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[2] *The Assembly:* 1. *Requests* the Council to instruct the Secretary General to issue periodically a study on regional differences in the level of international air transport operating costs, analysing how differences in operations and input prices may affect their levels and the impact that changes in costs may have on air transport tariffs;