

FOURTH MEETING OF THE ALLPIRG/ADVISORY GROUP

(Montreal, 6 – 8 February 2001)

Agenda Item 2.1: Interregional coordination and harmonization mechanisms - Harmonization of air navigation systems

MAIN AREAS OF IMPLEMENTATION OF THE INTERNATIONAL PROGRAMME “HARMONIZATION OF THE WORLD AIR NAVIGATION SYSTEM”

(Presented by the Russian Federation)

SUMMARY

This paper considers the International Programme prepared by the International Fund of Trustees of the K.E. Tsiolkovsky Moscow State Aviation Technology University (MSATU). Most attention is paid to the main areas of the implementation of the International Programme on the basis of how the world aviation transport system's situation has developed.

INTRODUCTION

The MSATU Fund of Trustees - Australia, Belarus, Cyprus, Czech Republic, France, Germany, Israel, Russia, United Kingdom and United States - with the support of extensive cooperation with the scientific community of these and other countries, developed the International Programme “Harmonization of the World Air Navigation System” in order to help speed up the rate of implementation of the future ICAO CNS/ATM concepts. The Programme includes institutional, economic, technical, technological and ergonomic measures that contribute to the development of future national air navigation systems and to ensuring their integration in the worldwide system. The measures proposed (projects) are of interest for air navigation services to flights in any country of the world. This should be a good basis for cooperative efforts by countries and successful work by ICAO and the Fund in this area.

DISCUSSION

Without dwelling in detail on all aspects of the implementation of the Programme, we shall consider some priority projects. The programme's priorities were defined as both the importance of the subject raised and the interest in resolving it on the part of the largest possible number of countries. Four such areas have been identified.

1. The problem of ensuring and increasing the level of air traffic safety that has been achieved presently in ICAO Member States.

The creation of a global air navigation system based on the implementation of the future ICAO CNS/ATM concept will inevitably come up against the problem of different approaches in countries to the definition of the permissible level of risk of an aircraft accident and the practical implementation of the concept of the target level of safety (TLS). These differences are presently so significant that they do not make it possible to compare unequivocally the levels of safety achieved in different countries. What should be taken into consideration in the definition of the target level of safety at the national, regional and global levels? What permissible deviations from this level can be established for all the cases considered? What should be the methodology for implementing the TLS at the stages of design and certification of air navigation systems and in monitoring its actual value? Must one take into account in the classification of aircraft accidents those cases where air navigation support was not the main cause, but an associated cause of the accident? It is necessary to maintain statistics on aircraft accidents for the whole air navigation system or only for the ATM system? How does one define the interrelationship of direct and indirect factors in the assessment of the actual level of safety?

Some of the problems listed may be solved within the framework of projects 3.7, 5.1, 5.4 and 5.7 of the International Programme presented. The make-up of those who implement the projects may be expanded if the desire for this is so stated.

The titles of the projects are given in the Appendix.

2. Solving the problems of flights on long international routes passing over the territory of Russia

There is no need to dwell long on the advantage of using the shortest routes that link continents, including cross-polar routes, some of which pass over the territory of Russia. The time saved in flying on these routes may be as much as several hours.

In view of the great length of these routes and the fact that they pass over barely developed areas of the North and Far East of our country with difficult climatic conditions, solving the problem of flight safety would be made significantly easier with the assistance of the States for which these routes are objectively advantageous. Projects 1.1, 1.2 and 1.3 should be considered as programme measures in this area.

Project 1.12 is also of interest. It involves the creation of an air navigation system to provide flight support for the aircraft of Russia's Gazprom to service drilling platforms in the waters of the Barents and Kara Seas. This project will obviously help to solve the energy problems not only of Russia, but also of other countries.

3. Creating a new technological breakthrough in air navigation services to flights, in addition to the ICAO CNS/ATM concept adopted

The analysis made shows that already in the very near future it will not be possible to ensure future levels of safety because of the limited capability of the human being even if automated prompting systems are available.

In order to understand how to further improve automated air navigation systems, it is necessary to produce models of an automatic ATM system on a demonstration testing unit (project 3.4). This will make it possible in the future to implement the principle of “human-machine” parallel work.

A powerful modelling base using a high level of expert systems will be required for this purpose (project 3.5).

4. Training specialists to work in the future air navigation system

The fast and effective retraining of all levels of staff involved with the implementation of the future CNS/ATM concept is the most important element in the implementation of the concept. It is therefore necessary to organize as soon as possible a centre for the training of the specialists involved in the implementation of the CNS/ATM concept, in accordance with the recommendations developed by ICAO. The support of ICAO and a number of countries where this work has been successfully done would be extremely useful.

CONCLUSION

The International Fund of Trustees of the K.E. Tsiolkovsky Moscow State Aviation Technology University proposes that international and other organizations, companies and private individuals review the Programme and it invites discussion on mutually advantageous cooperation in the implementation of the Programme’s projects.

— — — — —

APPENDIX**TITLES OF THE PROGRAMME PROJECTS MENTIONED IN THE TEXT****Section 1**

3.7 Development of a single classification, for ICAO Member States, of aircraft accidents caused by the air navigation system.

5.1 Development of the air traffic safety control concept and methods at the national level.

5.4 Development of methods used for the certification of the air navigation system and elements thereof on the basis of the target level of safety.

5.7 Development of principles and methods for substantiating State requirements for national air navigation systems, on the basis of the particular features of aviation activities and the economic resources of States.

Section 2

1.1 Development of a business plan and a project for equipping cross-polar routes going from North America to South-East Asia in order to increase significantly the effectiveness of international air services and to reduce the flying time.

1.2 Development of a project for equipping routes going from Northern Europe to South-East Asia through the airspace of the Russian Federation (Arctic-1) in the interests of ensuring the safety and effectiveness of air traffic.

1.3 Development of a programme for the phased modernization of a single air traffic management system in the Far East region of the Russian Federation in accordance with the ICAO concept for the implementation of CNS satellite systems for ATM (CNS/ATM) in order to meet the requirements of international air carriers for optimum routes.

1.12 Creation of an air navigation system for flight support for aircraft of Russia's Gazprom to service drilling platforms in the waters of the Barents and Kara Seas.

Section 3

3.4 Study of how to reduce the probability of controller errors in air traffic control under different conditions of complexity and technical resources used.

3.5 Study of processes and design of systems in the future air navigation system of the Russian Federation.

– END –