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**Agenda Item 2:           Air Navigation matters.**  
**2.1     Review of the Summary of Discussions of the Fourth C/CAR**  
**Working Group Meeting**

**BRIEF MET COURSE FOR AIR NAVIGATION PERSONNEL**

(Presented by Cuba)

**SUMMARY**

This Working Paper presents the actions carried out by Cuba to give a solution to the Meteorology training needs that support the C/CAR WG/4 Draft Conclusion 4/13.

**References:**

- Report on the Meteorology (MET) Divisional Meeting (2002).
- Final Report of the 12th Meeting of the Commission of the Aeronautical Meteorology (CMAe-XII).
- Reports on the Aeronautical Meteorology Subgroup of GREPECAS; AERMETSG/5 and AERMETSG/6.
- Reports on GREPECAS 10 AND 11 Meetings.
- Report of the C/CAR WG/4.

**1.           Introduction**

1.1           From 9 to 13 February 2004, the Fourth Meeting of the Central Caribbean Working Group Meeting (C/CAR WG/4) was carried out in Santo Domingo, Dominican Republic.

1.2           Under the Agenda Item 3, Cuba presented IP/12 on actions for the development of MET Services in the State. These actions included a brief MET course for personnel using MET services if other air navigation fields. Other States/Territories expressed an interest in the course and Cuba offered to make the course available. The Meeting therefore adopted the following Draft Conclusion:

**DRAFT**

**CONCLUSION 4/13 MET SHORT COURSE FOR AIR NAVIGATION PERSONNEL**

That,

- a) Cuba send the MET short course material to the ICAO NACC Regional Office by 30 April 2004; and
- b) ICAO coordinates the possible translation and distribution to C/CAR States/Territories.

1.3 The MET Cuban experts dedicated themselves to the task of preparing the necessary material to carry out the course. As per a suggestion from the Vice President, Argimiro Ojeda Vives, a request was sent to the ICAO NACC Office on the possibility to extend the period before putting it at the Subregion disposal, since we should first test this Course in Cuba and evaluate the results.

1.4 The course was carried out during May at the CAA (Aeronautical Training Centre) and its results (exposed in paragraph 2 below) were considered excellent, therefore, the Instituto de Aeronáutica Civil of Cuba validated the Methodology Plan of the Meteorology Course for the Aviation application (**Appendix**), to be presented to this Meeting.

**2. Discussion**

**2.1 Meteorology Course for the Aviation Application: Analyses on teaching experienced**

2.1.1 One the urgent needs that the Cuban aeronautical meteorology service presented was to have a short duration course which would allow to focus the attention towards the meteorological phenomena which more influence in the safety, regularity and efficiency of the en-route air navigation, aerodromes approach and landing.

2.1.2 Supported in Doc. No. 258 of the OMM, (Guidelines for the Meteorology and operative Hydrology personnel teaching and professional training, 4th. Edition), and taking into consideration various technical texts, a course was prepared oriented to update the aeronautical meteorology personnel, and that it could be extended to the air transit control personnel and airline dispatchers. The original version of this course was elaborated and conveyed in 1998 subsequently in 1999, in both cases only teaching conventional means were available (blackboard and slides show), also, supported by some maps and satellite photos.

2.1.3 Based in the experiences obtained and the current technological advantages, the thematic plan of the course was improved by introducing the Power Point slides in MS, which added a more efficient level to the classes. The subjects dealt with (visibility, icing, storms, turbulence and wind shear) were given in independent modules and as an evaluation, a teamwork was carried out to be defended at the end of the course.

2.1.4 Surveys were carried out at the end of the course as a quality evaluation method. The surveys applied during the first course (1998) gave very similar results to the method applied in the recently course held, as shown in the following table in which a percentage for the students composition who assisted and the responses received in a selection of questions formulated:

Students composition according to their educational knowledge:			
	<u>High level (university)</u>	<u>Middle level Technician</u>	
1998 Course	27%	73%	
2004 Course	25%	75%	
Question: ¿Were the subjects of your interest?			
	<u>Very much</u>	<u>Regular/not much</u>	
1998 Course	94%	3%	
2004 Course	95%	3%	
Question: ¿The subjects imparted have given you useful knowledge?			
	<u>Yes</u>	<u>No</u>	
1998 Course	95%	2%	
2004 Course	98%	-	
Question: ¿The subjects imparted should be extended in depth?			
	<u>Yes</u>	<u>No/not much</u>	
1998 Course	61%	34%	
2004 Course	51%	49%	
Question: ¿Other additional subjects should be imparted in this course?			
	<u>Yes</u>	<u>No</u>	<u>No answer</u>
1998 Course	64%	23%	14%
2004 Course	44%	25%	31%

2.1.5 Nevertheless, the similarity of the statistical results, were also obtained in addition with other criteria in respect to this course, which is interesting to point out. Among them, mainly the following are emphasized:

- The need to repeat these courses in order that a greater number of personnel linked to the aviation service;
- More time for classes, as well as to deepen and expand the subjects. (The course was designed for a total of 24 hours of which 12 hours are for practicing)
- Advisability to give these courses to pilots, as part of their reclassification or educational training.
- Among the precisions that some participants requested is also the inclusion of meteorological satellites pictures interpretation and the use of more updated technical means (software applied to meteorology).

### 3. Conclusions

3.1 The safety, regularity and efficiency of the air navigation is a fundamental objective which States should guarantee as per the compliance of the recommended regulations and practices contemplated in the Convention Annexes on International Civil Aviation and other documents. In the specific field of meteorology, this objective would only be accomplished by providing the operators, air flight crewmembers, AIS/ATM/CNS operational staff, airport administrations and other interested air transport operators, the relevant information.

3.3 Once the training needs in the aeronautical meteorology field are identified, each State is responsible to solve them in its territory. Nevertheless, the lack of financial resources of the States had promoted during the years the creation of a technical cooperation regional project, funded by the OMM, ICAO and other international organizations, which could provide a solution to this problem. These projects are difficult to implement and currently it should be consider the limited available resources to support its execution in an efficiently manner.

3.4 For a regional training, the future strategy should be supported even more in the modern communications means possibilities use, for example, Internet, to access the modules and distance courses, and the short-term seminars to reinforce the knowledge.

3.5 It should also be part of the State's strategy a beneficial usage on human, technological and financial resources, in order to continue a training plan elaboration not only to solve each State's problem, but also to allow the collaboration in an efficient manner through the search of solutions of the needs arisen at a regional level.

3.6 The short-term courses carried out in the modality of participative seminars, in which specific subjects are dealt affecting the air navigation, as in the recently held meteorology course applied to the aviation, which contribute in a very effective manner to the professional preparation of all the personnel which uses and it is based on the MET information, according to the air navigation safety.

#### **4. Suggested action**

4.1 The Meeting is invited to:

- a) take note of the information contained in this working paper;
- b) accept the Appendix to this note as Cuba's contribution to the C/CAR Sub region in support of the C/CAR WG/4 Draft Conclusion 1/13.

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## APPENDIX

## PLAN DEL PROGRAMA ANALÍTICO DEL CURSO DE METEOROLOGÍA APLICADA A LA AVIACIÓN

MODULE	Subjects	HOURS		
		THEORY	PRACTICES	TOTAL
1	<b>Introduction</b>	0:15		0:15
2	<b>Visibility</b> <ul style="list-style-type: none"> <li>▪ Definitions related to visibility.</li> <li>▪ Visibility importance for the aerodrome air operations and in the critical flight phases.</li> <li>▪ Causes affecting visibility (fog, precipitation, lithometeor)</li> <li>▪ Volcanic ashes; air navigation hazard.</li> </ul>	2:00	1	3:00
3	<b>Icing.</b> <ul style="list-style-type: none"> <li>▪ Definition.</li> <li>▪ Icing importance for the air operations in all flight phases.</li> <li>▪ Types of icing and necessary conditions for the aircraft ice formation.</li> </ul>	1:45	1	2:45
4	<b>Thunderstorms.</b> <ul style="list-style-type: none"> <li>▪ Definition.</li> <li>▪ Types of thunderstorm (frontal and air mass).</li> <li>▪ Meteorology phenomena associated to thunderstorms and its direct air navigation incidence.</li> </ul>	4:00	2:00	6:00
5	<b>Wind.</b> <ul style="list-style-type: none"> <li>▪ Definition. <ul style="list-style-type: none"> <li>a) Turbulence.</li> </ul> </li> <li>▪ Definition. Turbulence causes.</li> <li>▪ Aeronautical turbulence. Types of turbulence affecting the air navigation.</li> <li>▪ Aircraft turbulence effects. <ul style="list-style-type: none"> <li>b) Wind shear.</li> </ul> </li> <li>▪ Definition.</li> <li>▪ Wind shear causes.</li> <li>▪ Wind shear in aircrafts and in the approach, landing, take off and initial climbing.</li> </ul>	4:00	2:00	6:00
6	<b>Team work and evaluation.</b>		6:00	6:00
Total Hours		12	12	24