INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY FIFTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/25)

Kuala Lumpur, Malaysia, 8 – 11 September 2014

Agenda Item 3: Performance Framework for Regional Air Navigation Planning and Implementation

3.3: RASMAG

EFFORTS TO IMPROVE LARGE HEIGHT DEVIATION REPORTING FROM AIR TRAFFIC CONTROL UNITS IN CHINA

(Presented by the People's Republic of China)

SUMMARY

In RASMAG/19, there was concern regarding the lack of LHDs from China that may indicate a lack of a mature reporting culture.

This paper provides some updates about China RMA's effort during the following months in investigating the ATC LHD reporting situation, and also measures taken and lessons learnt to improve the LHD reporting mechanism from ATC units.

Strategic Objectives:

*A: **Safety** – Enhance global civil aviation safety*

1. INTRODUCTION

1.1 Concerns were raised during the RASMAG/19 meeting regarding the lack of LHDs from China that may indicate a lack of a mature reporting culture. A comparison of the estimated flight hours for airspace analyzed by China RMA, divided by the reported LHDs suggested an unreasonable ratio, and some category E LHDs concerning ATC errors reported by neighboring countries are not reported by Chinese FIRs. The meeting urged China to improve its mechanism of LHD reporting and develop a plan to establish an open reporting culture as part of a 'just culture' element of its safety management system by conducting a review, and requested China to report to APANPIRG/25 about progress made.

1.2 This paper provides some updates about China RMA's effort during the following months in investigating the ATC LHD reporting situation, and also measures taken and lessons learnt to improve the LHD reporting mechanism from ATC units.

2. DISCUSSION

2.1 When the China RMA members came back from RASMAG/19, a meeting was held in ATMB, CAAC to address the current LHD reporting situation. China RMA prepared an introductory material to discuss the following items:

1) the former LHD reporting mechanism in China;
2) the number of LHDs reported and the total flight hours of 2013;
3) the training material of LHD data collection the China RMA developed for airspace users; and
4) the discussions of LHD data collection issues among RMAs in the former international meetings (including RASMAG and RMACG).

2.2 China RMA explored, from the RMA's view, the possible causes leading to the lack of LHDs, and had a deep discussion with the ATC administrative experts of ATMB. China RMA also suggested a further investigation with controllers and relevant departments of ATC to develop a feasible solution. ATMB and China RMA members also drafted a work plan and listed the actions to be taken to improve the LHD reporting situation in China. The detail of these activities is provided in **Appendix A.**

2.3 After that meeting, ATMB and China RMA members started to make visits to all seven regional ATMBs in China and held LHD data collection workshops in each area. This activity started from the end of June and took about two months. During these workshops, China RMA invited representatives of controllers, ATC administrative level (e.g., executive director for ATC operation), safety dept. and in some areas technical support dept., from all the Enroute control centers/units which have RVSM operations to join the discussion. The workshop was a brainstorm process.

2.4 China RMA took this opportunity to explore the controllers' understanding about LHD reporting, and discussed with them about the problems and questions they had as for the definition, categories, criteria and reporting template. China RMA also collected their suggestions in making improvement. The detail of these activities is listed in **Appendix B**. The possible causes leading to the lack of LHD reporting are listed in **Appendix C**. China RMA also prepared a training material of LHD data collection and discussed the contents with the controller supervisors from each area. The aim of this training is to let all these supervisors to have a common understanding about the LHD, especially for the category E ATC errors etc., so that after this training, they are able to train the controllers in their own centers.

2.5 During the discussions, it is found that the following items are the leading causes of potential lack of reporting:

1) <u>The term Large Height Deviation does not clearly indicate the type of error involved, especially as for category E event which is a failure of coordination between adjacent ACCs involved.</u>

   Because the term of LHD suggest an actual departure from, or failure to attain the assigned flight level, but category E event often involves aircraft flying in compliance with their ATC clearance but without ATC protection. This topic was discussed during the RMACG/9 meeting and NATCMA had a working paper (WP165).

   China RMA suggest a new term 'operational deviation error' for domestic use to replace the term 'LHD'. The representatives of the workshop agree to use the new term to avoid any misunderstanding. 'Operational deviation error' indicate a lack of ATC situational awareness in RVSM airspace.

2) Reporting template is complicated

The controllers suggest an easier version of reporting template so that they can spend less time to make records for each event, which will facilitate the controllers to report more. Attachment A provides an updated version of reporting template for ATC use. The causes of the event are not using the ICAO LHD category table directly, but each cause of event in this template can correlate to one category in the ICAO LHD category table

3) Reporting culture and work flow need to be improved

Safety is priority. Controllers have high pressure during their work, and sometimes they are reluctant to report errors and avoid trouble whenever possible. Some controllers may still worry that the reporting of LHDs may have bad effect for himself or his team. Also, there are well established incident reporting mechanism, and controllers may be confused about the difference between incident reporting and LHD reporting. Some events are reported in different ways using different reporting systems, and the duplicate record may bring additional work to the controllers.

After the investigation of LHD reporting, ATMB realized that more work should be done to improve the safety culture and to encourage the controllers to report these errors. And also, there should be some clarification about incident reporting and LHD reporting for the controllers. It is also suggested that the regional ATMBs refine internal reporting procedures to reduce the controllers' workload of reporting safety related events.

2.6 After the completion of workshops, ATMB summarizes the lessons learnt during these visits and the suggestions raised by each area. A notice will be issued to standardize the LHD reporting mechanism. China RMA will also follow the task list in Appendix A to further advance the progress and provide introductory materials to the following ICAO meetings.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

a) review the content of this paper; and

b) comment on the work discussed in this paper.

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中国地区监控组织
CHINA REGIONAL MONITORING AGENCY

Reporting Unit：

Operational Deviation Error in RVSM Airspace

Date（UTC）	Callsign	Location	Route	Assigned FL	Actual FL	Duration at the Incorrect Flight Level	Level Crossed without ATC Clearance	Other Traffic
							Climbing rate Descending rate	

90m or above from Assigned FL：

1. Technical Issues：

☐ Deviation due to airborne equipment failure
☐ Deviation due to TCAS resolution advisory
☐ Deviation due to aircraft contingency event

2. Meteorological Condition ：

☐ turbulence or other weather related cause

3. Flight Crew：

☐ failing to climb/descend the aircraft as cleared
☐ climbing/descending without ATC Clearance

4. ATC：

☐ incorrect clearance
☐ ATC delivery of operational information error

Coordination errors：

1. ATC：

☐ late or non-existent coordination
☐ incorrect flight level/ flight number
☐ incorrect transfer location:_____
☐ incorrect time estimate/actual
The actual difference is :_____

2. Equipment ：

☐ equipment outage or technical issues

Lack of safe separation：

☐ unable to establish normal air-ground communications
☐ not RVSM approved
☐ lose RVSM capability during flight
☐ other_____

Remarks：

RVSM AIRSPACE: FLIGHT LEVEL BETWEEN FL291 AND FL411 IN CHINA, AND FL290 AND FL410 IN OTHER AREAS

APPENDIX A TASK LIST TO IMPROVE LHD REPORTING IN CHINA

	DESCRIPTION	PEOPLE INVOLVED	TIME FRAME	Status
1.	Hold a meeting to discuss possible causes leading to the lack of LHDs, and develop work plan	ATC experts from ATM division of ATMB, CAAC China RMA members	Early June	completed
2.	LHD data collection workshops in seven regional ATMBs. Each week to one regional ATMB. The following items were reviewed and discussed: (1) review current LHD reporting situation (2) discuss problems concerning reporting mechanism (3) discuss questions concerning definition, categories, criteria, reporting template, etc. (4) suggest adjustment to definition and reporting template (5) suggest possible solutions to improve reporting (internal) mechanism of ATC (6) suggest adjustment to training material (a PowerPoint prepared by China RMA) (7) point of contact related to LHD reporting (8) other issues: (a) special cases of LHDs (b) LHDs and safety assessment	ATC experts from ATM division of ATMB, CAAC China RMA members RVSM point of contact from regional ATMB ATC administrative level representatives from regional ATMB In some regional ATMB also representatives from Safety dept. and technical support dept., Controllers representatives (supervisors) from the Enroute control centers/units under the administration of each regional ATMB	End of June to End of August	completed
3.	Provide material to ICAO APAC regional office to introduce the updates	China RMA members	Early September	completed
4.	Provide a working paper to APANPIRG meeting to introduce the details of recent activities, work plan and lessons learnt	ATC experts from ATM division of ATMB, CAAC China RMA members	Early September	completed
5.	Prepare and publish a notice to standardize the LHD reporting mechanism based on the comment and suggestions collected from each regional ATMBs. The notice include: (1) a final version of training material (2) an updated version of LHD reporting template. (3) a guidance of requirement to update ATC internal LHD reporting mechanism inside each Enroute control centers/units, including the amendment of ATC work manual, designation of point of contact and responsibilities, training requirement, etc., in order to form a long-term mechanism	ATC experts from ATM division of ATMB, CAAC China RMA members	September	On-going

	(4) The difference between LHD reporting mechanism and incident reporting mechanism, and encourage the controllers report LHDs (5) Time frame for all Enroute control centers/units to conduct internal training (6) 6) A trigger date for all centers/units to switch to the new template			
6.	Arrange training for all controllers	All Enroute control centers/units Controllers representatives (supervisors) who attended the workshop	September to November 2014	TBD
7.	Establish internal procedure to improve reporting: (1) designation of point of contact (2) update of work flow (3) update of ATC work manual (4) update of training requirement	RVSM point of contact from regional ATMB And related Enroute control centers/units	September to November 2014	TBD
8.	Provide feedback to ATMB about the actions taken to improve LHD reporting in each ATMB and the related Enroute control centers/units	RVSM point of contact from regional ATMB And related Enroute control centers/units	Before end of December 2014	TBD
9.	Collect LHDs reported and evaluate the improvement effect	China RMA members	After October	TBD
10.	Provide a working paper to RMACG/RASMAG meeting next year to introduce the effort in improving LHD reporting, the lessons learnt, questions and suggestions	China RMA members	2015	TBD
11.	Provide a working paper to RMACG/RASMAG meeting next year about the introductory material of LHD reporting	China RMA members	2015	TBD

APPENDIX B CHINA RMA VISITS TO SEVEN REGIONAL ATMBS

	DATE OF VISIT	PLACE OF VISIT	PROGRESS MADE	WHAT DID CHINA RMA DO AFTER THIS VISIT
1.	June,27	North China Regional ATMB in Beijing	LHD reporting mechanism investigation: 1. Controllers explored from their views the causes leading to the lack of LHD reporting; 2. they think the terminology of 'Large Height Deviation' does not clearly indicate the type of error involved in the LHD table and need to change, or it is confusing	1. Make a preliminary training plan for all seven centers 2. Develop a new training material (a ppt presentation) 3. Make a list of causes leading to the lack of LHD reporting for further investigation 4. Prepare some new terminologies to replace 'Large Height Deviation' 5. draft a minutes of workshop
3.	July, 3	North China Regional ATMB in Beijing	LHD training material consultation: 1. Controllers give suggestions to the adjustment of LHD reporting template, and 2. raise questions about Category E and M LHD reporting; especially LHDs between China and Mongolia 3. raise concerns about the bad effect after reporting LHDs	1. Develop a new LHD reporting template suitable for controllers 2. Update the Category E illustration based on MAAR's material and give detail about the determination of event element 3. Provide examples and the RMA's understanding about category M LHDs 4. Provide a draft of LHD reporting requirement in the ATC work guidance 5. draft a minutes of workshop
4.	July, 10-11	Northwest China Regional ATMB in Xi'an	LHD reporting mechanism workshop and ATC supervisor training 1. give suggestions to the adjustment of LHD reporting template 2. raise questions about Category D, E and M LHD reporting; especially ATC coordination errors concerning AIDC operations(technical problems) 3. give suggestions to the amendment of work manual 4. suggest possible solutions in controller team management	1. Make adjustment to LHD reporting template 2. Update the Category E illustration, add AIDC related examples 3. Fill in the new templates for each examples and add these forms to the training materials 4. Update the list of causes leading to the lack of LHD reporting, and provide possible solutions for some items 5. Contact technical dept. to confirm and solve the issues concerning AIDC 6. draft a minutes of workshop
5.	July, 17-18	Southwest China Regional ATMB in Chengdu	LHD reporting mechanism workshop and ATC supervisor training 1. Controllers raise concerns about the bad effect after reporting LHDs 2. give opinions about new terminology to replace 'Large Height Deviation'	1. Update the Category E illustration, suggest methods to estimate duration 2. Add their suggestions about feasible ways of LHD reporting workflow to the training material for further investigation 3. Update the list of causes leading to the lack of LHD

			3. give suggestions to the amendment of work manual and reporting template 4. suggest feasible ways of LHD reporting workflow 5. raise questions concerning category E error in radar control area	reporting, and provide possible solutions for some items 4. draft a minutes of workshop
6.	July, 24-25	Northeast China Regional ATMB in Shenyang	<u>LHD reporting mechanism workshop and ATC supervisor training</u> 1. Controllers mentioned the confusion about LHD reporting mechanism and the well- established incident reporting mechanism 2. suggest feasible ways of LHD reporting workflow 3. raise questions concerning category E error in radar control area 4. suggest ways of incentives in LHD reporting	1. Add their suggestions about feasible ways of LHD reporting workflow to the training material for further investigation 2. Update the list of causes leading to the lack of LHD reporting, and provide possible solutions for some items 3. Consider their suggestions of incentives in LHD reporting 4. Contact safety dept. of ATMB for information about incident reporting mechanism, and add comments to the training material to distinguish it with LHD reporting 5. draft a minutes of workshop
7.	July, 31 August, 1	East China Regional ATMB in Shanghai	<u>LHD reporting mechanism workshop and ATC supervisor training</u> 1. raise questions about Category E and M LHD reporting; especially ATC coordination errors concerning AIDC operations (technical problems) 2. reported airbus aircraft may have short term stay on the incorrect height due to aircraft performance 3. give opinions about new terminology to replace ‘Large Height Deviation’ 4. suggest using ‘aviation safety reporting website’ for LHD reporting	1. Contact ‘aviation safety reporting website’ and investigate the possibility for all centers to use this website for LHD reporting 2. Update the list of causes leading to the lack of LHD reporting, and provide possible solutions for some items 3. Further investigate the issues concerning airbus operation 4. draft a minutes of workshop
8.	August, 7-8	Middle and South China Regional ATMB in Guangzhou	<u>LHD reporting mechanism workshop and ATC supervisor training</u> 1. Give suggestions to the change of terminology of LHD 2. Clarify LHD criteria, especially for the start and end of an event 3. Introduce their internal safety event reporting system used in Middle and South China	1. investigate the possibility of a web service platform to report LHD 2. draft a minutes of workshop
9.	August, 14-15	North China Regional ATMB in Beijing	<u>ATC supervisor training</u> 1. Give suggestions to the change of terminology of LHD	1. draft a minutes of workshop

10.	August, 21-22	Xinjiang China Regional ATMB in Beijing	<u>LHD reporting mechanism workshop and ATC supervisor training</u> 1. Discuss Xinjiang-Lahore category E events 2. give suggestions to the change of terminology of LHD 3. suggest a change to the reporting template about category D loop error event	1. draft a report about the Xinjiang-Lahore category E events 2. draft a minutes of workshop

APPENDIX C POSSIBLE CAUSES LEADING TO THE LACK OF LHD REPORTING

(A) Technical level problems

1. The term 'Large Height Deviation' does not clearly indicate the type of error involved in the LHD category table, especially for Category E errors which is the major cause of LHDs and appears to be the dominant contributions to the operational errors;
2. The lack of common understandings about some LHDs, especially for Category E. For instance, the determination of durations;
3. The criteria for identifying some LHDs, especially for Category M;
4. The LHD template may not be easily applied by controllers to record LHD details

(B) Administrative level problems

1. Safety culture: Safety is priority, so the tolerance for ATC errors is very low. Controllers have high pressure, and they are reluctant to reporting errors and avoid trouble whenever possible. Though it has been clarified many times by RMA that the LHDs are for risk estimate, some controllers may still worry that the reporting of LHDs may have bad effect for himself or his team.
2. With the successful of RVSM implementation over years, the ATC units are paying less attention to LHD reporting. In some units, LHD POC changed, successor activities are not conducted well. Trainings or refreshment have little introduction about LHD reporting.
3. No mandatory requirements in the ATC work guidance for LHD reporting.
4. The LHD category table keeps changing over years, but this table and relevant introductory materials are not provided to the ATC timely.
5. Duplicate record of safety related events by different systems. Internal reporting mechanism should be refined.