International Civil Aviation Organization

Thirtieth Meeting of the Regional Airspace Safety Monitoring Advisory Group (RASMAG/30)

Bangkok, Thailand, 14 – 17 July 2025

Agenda Item 3: Reports from Asia/Pacific RMAs and EMAs

CLASSIFICATION OF FOUR EVENTS IN NANNING AIRSPACE AS M-CLASS LHD INCIDENTS

(Presented by China RMA)

SUMMARY

This paper presents the risk analysis of four aircraft deviation events in Nanning airspace between April and June 2024. These events involve aircraft entering the R343 route instead of continuing R474. Based on the ATM/SG/12 IP12 report, further analysis will be conducted at RASMAG/30. China RMA proposes classifying these events as M-category Level Height Deviation (LHD) incidents. Although the aircraft appeared at an unexpected flight level, the controllers' continuous specific surveillance means duration time shouldn't be counted. This conclusion was presented at RMACG/20 and recognized by the meeting.

1. INTRODUCTION

1.1 The ATM/SG/12 IP12 (**Attachment A**) report highlights the risks of aircraft deviations in Nanning. It mentions that further analysis of these events will be presented at RASMAG/30.

1.2 The IP12 report mainly focused on procedural discussions, so the China RMA conducted an in-depth analysis of airspace safety risks and is presenting it at this meeting.

1.3 Accurate LHD incident classification is crucial for RVSM airspace safety. The recent deviations in Nanning don't fit existing LHD categories (A to L), necessitating classification as M-category incidents.

1.4 These events involve aircraft deviating from planned routes, introducing unexpected elements into RVSM airspace and affecting safety assessments.

2. DISCUSSION

Event Descriptions

2.1 As shown in **Figure 1**, four events occurred in Nanning in 2024 involving aircraft on the R474 airway from Hanoi Vietnam to Osaka Japan. After passing the fix point of WUY, all deviated onto the R343 airway. Details:

a) **April 12, 2024:** XXX938 (A21N) entered the Nanning ACC at FL210. After passing WUY, the aircraft began turning left towards R343. The controller intervened, redirecting the aircraft to OSIKA to rejoin R474. The maximum deviation was approximately 10 kilometers.

b) **April 17, 2024:** XXX 938 (A21N) was climbing from 7500 meters to 8900 meters. After passing WUY, the aircraft turned towards R343. The controller issued a right turn to 085 degrees and redirected the aircraft to OSIKA. The maximum deviation was 15.2 kilometers.

c) **May 15, 2024:** XXX 938 (A21N) was climbing from 9200 meters to 9500 meters. After passing WUY, the aircraft turned towards R343. The controller issued a right turn to 090 degrees and redirected the aircraft to OSIKA. The maximum deviation was 18.5 kilometers.

d) **June 6, 2024:** XXX 938 (A21N) was climbing to 9500 meters. After passing WUY, the aircraft joined R343. The controller redirected the aircraft to fly heading 120 and then to P20 to rejoin R474. The maximum deviation was 35 kilometers.

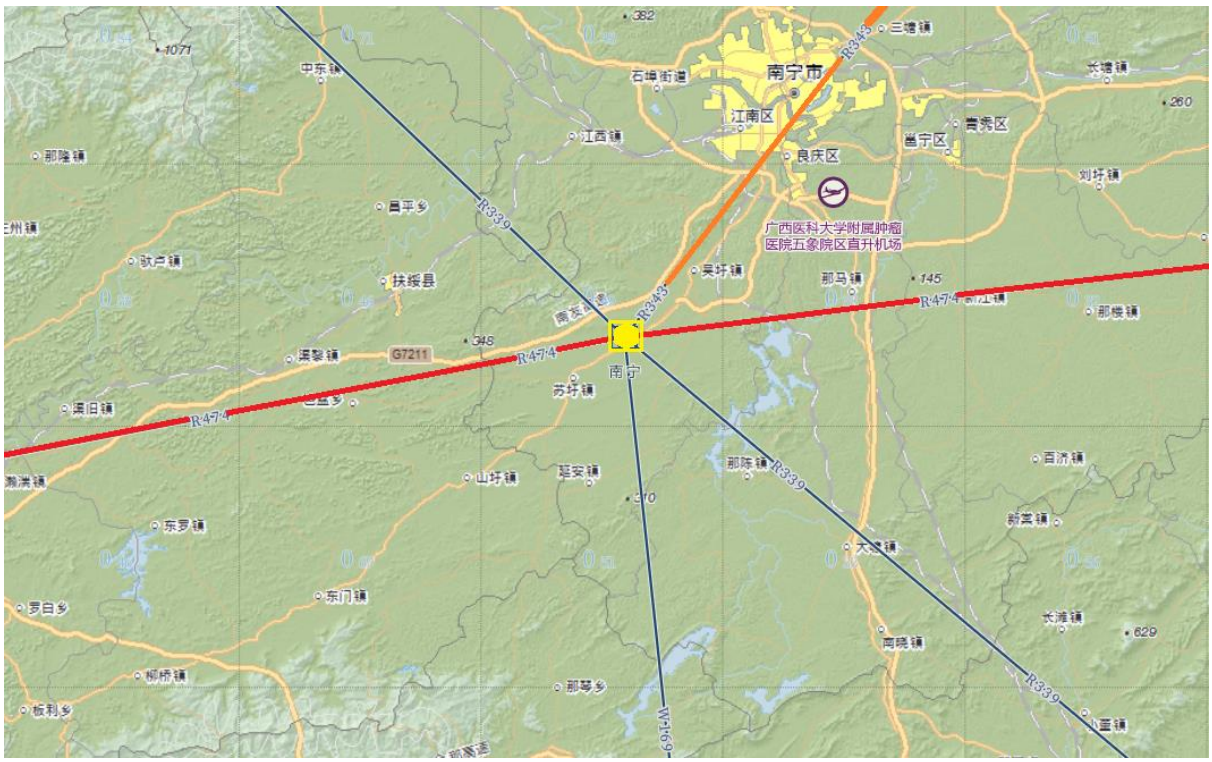

Figure 1: Routes around WUY Fix Point

Argument for LHD Classification

2.2 These four events should be classified as LHD incidents because they involve deviations from the planned route, effectively introducing an "unexpected aircraft" into the R343 airway on any FL in RVSM airspace.

2.3 The vertical separation between aircraft is a critical safety parameter. When an aircraft deviates from its planned airway and enters a different airway not expected to have aircraft from that operation in the controller's scenario, especially creating possibility of a potential vertical overlap with other aircraft that may be operating in or near the R343 route.

2.4 However, duration time shouldn't be counted in this case. According to the LHD definition, although the aircraft appeared at an FL where it shouldn't, the controllers had continuous specific surveillance of the aircraft. This means the deviation was under control and didn't persist in an uncontrol state. This conclusion was presented at RMACG\20 and recognized by the meeting.

Insights from IP12 Report

2.5 The IP12 report highlights the risks and challenges of aircraft deviations in Nanning:

a) Workload and Communication: Foreign pilots, especially those with heavy accents or differing English comprehension, may experience inefficient air-ground communication and difficulty in executing instructions. This can increase the workload of both controllers and pilots, thereby affecting the efficiency of incident resolution.

b) Operational Risks: The Nanning airspace is complex, with many restricted areas and increasing mixed flight operations. Deviations from planned routes can lead to aircraft entering danger zones, restricted areas, or causing conflicts between military and civilian aviation flights. These situations can exceed controllers' expectations, making preset conflict resolution plans inapplicable and leading to passive conflict resolution.

c) Route Confusion: Airline operators may become confused during flight preparation, especially when there are many ATS routes between city pairs. This confusion can result in crews following incorrect routes, particularly when a single fleet operates the same city-to-city flight.

China RMA's Risk Analysis

2.6 The China RMA conducted a risk analysis of these events and concluded that they should be classified as LHD incidents but without counting duration time. The reasons are:

a) The aircraft's unexpected presence on a different FL introduces safety risks to RVSM airspace.

b) The controllers' continuous specific surveillance ensured the situation was under control.

c) This approach aligns with the LHD definition and the unique circumstances of these events.

3. CONCLUSION

3.1 The four Nanning events should be categorized as M LHD incidents without counting duration time. This classification accurately reflects their impact on RVSM airspace safety assessments while considering the controllers' monitoring efforts.

4. ACTION BY THE MEETING

4.1 The meeting is invited to:

a) review the information provided in this paper.

b) discussed any relevant matters, as appropriate.

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Attachment A: RISK ANALYSIS OF AIRCRAFT DEVIATION FROM THE PLANNED ROUTE IN NANNING AREA CONTROL AIRSPACE

International Civil Aviation Organization

Twelfth Meeting of the Air Traffic Management Sub-Group (ATM/SG/12) of APANPIRG

Bangkok, Thailand, 23 – 27 September 2024

Agenda Item 8: Any other business

RISK ANALYSIS OF AIRCRAFT DEVIATION FROM THE PLANNED ROUTE IN NANNING AREA CONTROL AIRSPACE

(Presented by China)

SUMMARY

This paper presents the analysis of the risk of aircraft deviation from the flight planned route in Nanning Area Control airspace and the experiences to solve the problem.

1. INTRODUCTION

1.1 Since 2024, a total of 4 mis-planned flights occurred in Nanning Area Control. The incidents have obvious common features, the flights are operated by the same company and a single fleet of Airbus 320 Neo, shuttling on the same city pair, and fourth, they all have deviated from the planned route after crossing the WUY VOR. Specific information of the incidents is as follows.

2. DISCUSSION

Risk of aircraft deviation from the planned route

2.1 Risk Analysis

a) Nanning Area Control airspace is complex, with many restricted areas of other users in the same airspace, mixed flight operations in this area are increasing. If civil aircrafts follow a mistaken route or deviate from planed route, and controllers fail to correct them, the aircrafts may enter the danger zone, restricted area, reserved area, and even cause conflicts of military and civil aviation flights.

b) As the conflict situation may beyond the controller's expectation, the pre-set conflict disposal plan will be unapplicable, which will most likely lead to the controller's passive implementation of conflict resolution, resulting in risks such as aircrafts being smaller than specified separations.

c) Foreign pilots, especially pilots in the above incident, sometimes have a heavy speaking accent, and their own English comprehension is different with pilots from native English-speaking countries. following a deviation from their flight planed route, the problems of inefficient air-ground communication and inefficient execution of instructions are likely to occur, which will increase the workload of both controllers and pilots, affecting the efficiency of disposal at the same time.

d) As there are a lot of ATS routes between some city pairs, it is easy for airline operators to get confused during the flight preparation stage, resulting in failure to find the

correct approved routes. When a single fleet in a company fly the same city-to-city flights, it is very easy for the crews to follow the same mistakes that take a wrong route. In the case of an incident on April 12, 2024, for example, it was confirmed by the ATC and flight crew that the route data in the aircraft's computer did not match their flight plan.

e) International flights, especially flights originate from South-East Asia, are growing rapidly, and some airlines are developing very fast in their fleets but their management needs improvements to be capable as well.

2.2 The Department of Control and Operations of Guangxi ATM Sub Bureau have emphasized "foreign airlines that are unfamiliar with the operation environment" in the list for risk management. In addition, to help ATC to relieve the consequences of frequent occurrence of deviations from planned routes since 2024, a "Safety Risk Circular on the Deviation of Foreign Airlines from the Planned Routes" was issued. The risk control measures are as follows:

a) Enhancing the effectiveness of radio communication and improve the English communication skills of controllers. A three-year implementation plan to improve controllers' English communication skills is running by Guangxi ATM Sub-Bureau, also established a long-term mechanism for ATC English training, conducting quarterly controller's language ability assessment with 213 participants this year. Since the launch of the three-year plan, controllers' pass rate of CAAC ATC English Test for the first time is 88.6% and currently all controllers are certified.

b) Organizing and carry out the controllers, pilots, dispatchers interact activities to strengthen the business exchange between ATC and airline companies, and enhance the awareness of air-ground consistency. In 2023, we invited flight officials and agents of the airline companies flying between Nanning and Southeast Asia, to join a special exchange meeting on flight techniques in airports, which achieved a good result.

c) The ATM Sub Bureau has reported to the authorities of CAAC about the recent deviation incidents. We are expecting a face-to-face communication with airline companies when available.

d) The ATM Sub Bureau has reported to reginal Operation Control Center (OCC) to notice the CAAC supervisory about the inconsistency of the routes of flights by the same carrier, the same aircraft type, the same departure and destination, and to request the CAAC supervisory to pay attention to this.

e) The conflict resolving of some typical incidents is used as a fixed training scenario in simulator training. Following the Conflict Resolving Operation Guidelines, controllers' conflict resolving ability is improved through special training and assessment.

f) Leveraging the review and analysis system to carry out cases comparison and analysis, accumulating experiences in actual operations.

g) Acknowledging and confirming system alerts carefully. At present, the automated system has an alarm function of inconsistency between the actual flying route and FPL message, controllers are required to check every alarm one by one.

h) Developing standard operating procedures for correcting aircrafts' deviations from planned routes. Using radar vectors to instruct pilots to join the correct flight path as early as possible to avoid a deterioration of the situation and prevent further conflicts.

i) Sorting out and identify flight plans with similar risks and manage them in a timely manner. Manuals and instructions are created, some "unconventional" routes are highlighted, all controllers are required to learn and understand.

2.3 Further Actions

a) Organizing tech specialists to study the applicable scenarios of "Short-Route Probe (SRP)" function of the ATC automation system, and appropriately set the parameters according to the actual operation requirements. Improving the operation procedures of this function, so that controllers can more intuitively see the difference between the flight plan route and the current trajectory of the flight.

b) Requiring some inbound flights to report the route after WUY VOR or the next route point before 20KM position of WUY VOR, to facilitate controllers to establish situational awareness in advance.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

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