Eighteenth Meeting of the Cross Polar Trans East Air Traffic Management Providers' Work Group (CPWG/18)

(Paris, France, 16-19 December 2014)

Agenda Item 5: Provide Status on CPWG/17 Actions

Reroutes and Coordination Issues Associated with Volcanic Events

(Action Item #CP16-06 and CP17-01)

(Presented by the United States)

SUMMARY

This working paper presents information on issues raised by a case study provided by American Airlines at the 16th Meeting of the Cross Polar Trans East Air Traffic Management Providers' Work Group and seeks a way to harmonize the best practices for handling significant reroutes of numerous aircraft for the Group to consider.

1. **Introduction**

1.1 During the 16th Meeting of the Cross Polar Trans East Air Traffic Management Provider's Work Group (CPWG/16), American Airlines (AAL) presented a working paper (WP04) regarding events affecting an airborne flight during the eruption of the Kliuchevskoi Volcano on the Kamchatka Peninsula on 16 October 2013.

1.2 Updated information provided by Tokyo VAAC indicated that the original impact of the Kliuchevskoi eruption may have been greater than originally forecast. A decision to re-evaluate the published westbound Pacific Organized Track System (PACOTS) flex tracks was made with collaboration from airline operators, Anchorage ARTCC (ZAN), Oakland ARTCC (ZOA), and other stakeholders. A decision to amend the PACOTS about ten degrees south of where they were originally planned was reached and the tracks were reissued accordingly.

1.3 At the time the decision was made to reissue the PACOTS, AAL175 was approximately 45 minutes into their flight from KDFW to RJAA. AAL dispatch began working with their flight crew and ATC to reroute the aircraft. The AAL dispatcher issued a new routing to the aircraft via ACARS and sent the same routing to ATC.

1.4 There were several issues noted with coordination of the new routing and issuance of the route to the flight crew. AAL noted that while they submitted a new flight plan to US domestic ATC, the flight plan was not received by the facility currently working the aircraft or those facilities further along the aircraft's route in U.S. domestic airspace. Flight plan information was sent successfully to both Russia and Japan. However, it was noted that there were some coordination issues with Japan because they had already received departure message information on the original flight plan.

1.5 The Federal Aviation Administration (FAA) presented a working paper (WP/10) during the CPWG/17 meeting addressing some of the concerns raised by AAL. Based on the study provided by AAL, it was noted that there are shortfalls in existing procedures during volcanic eruptions or other events where route changes need to be made. Several questions were raised, including the following:

- What is the best way to coordinate a reroute once an aircraft is airborne?
- What resources are available for coordination (e.g. MATMC, ATCSCC, etc.)?
- Who is responsible and what is the best mechanism for coordinating entry into airspace that was not originally part of the aircraft's flight planned route? For instance, in the case of AAL175, what would be the best way to assure timely coordination and approval to overfly Russian airspace?

1.6 In addition, Japan Civil Aviation Bureau posed the following questions:

- Does Flight Data deal with CHG messages or are they automatically updated in the flight plan?
- Do dispatchers and pilots agree when a CHG message is sent to an ATC facility?
- Are reroutes issued when a CHG message is received from an aircraft in flight?
- Are there any disadvantages when ATC receives a route change request directly from an in-flight aircraft?

1.7 This paper seeks to answer the above mentioned questions and to develop a harmonized approach as to how to best handle significant reroutes for multiple aircraft.

2. Discussion

Use of CHG Messages

2.1 It is important to note the phase of flight an aircraft is in when discussing how ATC systems will respond to a CHG message. For the FAA, the phases would be:

- Prior to departure;
- In flight but prior to oceanic entry; and
- Within the oceanic environment.

2.2 In response to JCAB's question regarding whether Flight Data must coordinate CHG messages or if they are automatically processed:

- If the CHG message is received 45 minutes or greater prior to proposed departure time at a domestic FAA controlled airport: the CHG message is automatically processed.
- If received less than 45 minutes prior to proposed departure time at a domestic FAA controlled airport: the CHG message is normally rejected with a message of "manual coordination required" returned to the CHG message initiator.
- Once a flight has departed but prior to flight plan activation in the Advanced Technologies and Oceanic Procedures (ATOP) system (about 40 minutes prior to the FIR boundary): the CHG message is rejected in FAA domestic systems but accepted in

ATOP.

- If an aircraft operator initiated a CHG message but the aircraft never received the new route clearance, the CHG message and subsequent FPL could be overridden if the ABI or current flight plan (CPL) message is passed via AIDC. However, there is potential for error if manual coordination is required or if other problems prevent the CPL from passing correctly via AIDC.
- If the CHG message is received after the flight is active and in an ATOP sector, the controller would receive a message stating "[ACID]: Invalid main flight state, no update."

2.3 In response to JCAB's question on whether there are disadvantages of an inflight aircraft requesting a reroute directly from ATC there are three potential things to consider:

- Non-CPDLC aircraft/facilities may encounter issues with frequency congestion and hearback/readback errors.
- The reroute clearance must be given directly to the aircraft. This provides assurance that the aircraft can accept the reroute.
- In the CPDLC environment, the downlink of a requested reroute and corresponding uplinked clearance autoload into the FMS thereby removing the possibility of discrepancies being introduced by readback/hearback or waypoint insertion errors. (It is felt, at least by the FAA, that these advantages outweigh the disadvantages.)

Determining a Harmonized Way Forward

2.4 As discussed during the CPWG/17 meeting, there were several shortfalls noted in existing procedures. Some of these were noted as:

- What is the best way to coordinate a reroute once an aircraft is airborne?
- What resources are available for coordination (e.g. MATMC, ATCSCC, etc.)?
- Who is responsible and what is the best mechanism for coordinating entry into airspace that was not originally part of the aircraft's flight planned route? For instance, in the case of AAL175, what would be the best way to assure timely coordination and approval to overfly Russian airspace?

2.5 Based upon the discussion on CHG messages, the following questions are posed for CPWG to consider:

- What are operator requirements for utilizing a CHG message when a reroute is required for an aircraft already in flight?
    - Are there requirements in ICAO Documents and Annexes for use of CHG messages on airborne aircraft?
- How does each State process CHG messages in the phases described at 2.1 of this working paper?
- How do airlines currently obtain approval to transit certain airspace volumes where advanced coordination and approval is required?
    - Is the process/mechanism different for an airborne aircraft that is rerouted into

such an airspace volume vs. one that has yet to depart vs. one that is planned to transit such a volume?

- Is the use of CHG messages or rejection of such messages consistent for all ANSPs and aircraft operators?

3. Action by the Meeting

3.1 The meeting is invited to:

a. review the information contained in this Working Paper;

b. develop a harmonized approach to handling reroutes on airborne aircraft.