Special Air-Reports

29 June 2016

Japan Meteorological Agency
Aircraft Observations

**Obligations of States**
Each Contracting State shall arrange, according to the provisions of this chapter, for observations to be made by aircraft of its registry operating on international air routes and for the recording and reporting of these observations.

**Types of aircraft observations**
The following aircraft observations shall be made:

a) routine aircraft observations during en-route and climb-out phases of the flight; and

b) special and other non-routine aircraft observations during any phase of the flight.

From ICAO ANNEX 3
Special Aircraft Observations

Special aircraft observations shall be made by all aircraft whenever the following conditions are encountered or observed:

- moderate or severe turbulence
- moderate or severe icing
- severe mountain wave
- thunderstorms, without hail, that are obscured, embedded, widespread or in squall lines
- thunderstorms, with hail, that are obscured, embedded, widespread or squall lines
- heavy duststorm or heavy sandstorm
- volcanic ash cloud
- pre-eruption volcanic activity or a volcanic eruption

From ICAO ANNEX 3
Importance of Special Aircraft Observations

- Airlines are the main users of the SIGMET information. They contribute to the effectiveness of the SIGMET service through issuance of special air-reports reported by pilots to the ATS units.

- Special air-reports are among the most valuable sources of information for the MWOs in the preparation of SIGMET. (From the ICAO APAC Regional SIGMET Guide)

- Forecasters can obtain information on actual upper-air weather conditions from special air-reports.

- In particular, special air-reports are the sole source of information on clear-air turbulence for forecasters.
Aircraft observations shall be reported by air-ground data link.

Where air-ground data link is not available or appropriate, aircraft observations during flight shall be reported by voice communications.

Aircraft observations shall be reported during flight at the time the observation is made or as soon thereafter as is practicable.

Aircraft observations shall be reported as air-report.

Even when automatic dependent surveillance (ADS) is being used for routine air-reports, pilots should continue to make special air-reports.

Pilots should compile special air-reports and disseminate to ATS.
The meteorological authority concerned shall make arrangements with the appropriate ATS authority to ensure that, on receipt by the air traffic services units of:

- special air-reports by voice communications, the ATS units relay them **without delay** to their associated meteorological watch office.
- special air-reports by data link communications, the ATS units relay them **without delay** to their associated meteorological watch office and WAFCs.

The ATS units concerned should also transmit to aircraft-in-flight the special air-reports received, for which SIGMET has not been issued. Once a SIGMET for the weather phenomenon reported in the special air-report is made available this obligation of the ATS unit expires.

From ICAO ANNEX 3

From the ICAO APAC Regional SIGMET Guide
Information Flow

Severe turbulence!

In real time or as soon as practicable

Special air-report (without delay)

Supplies SIGMET

ATS unit (air traffic services unit)

MWO (meteorological watch office)

WAFCS, other MWOs, airlines, etc.

Disseminates SIGMET
Elements of Special Air-reports (Air-ground Data Link)

Message type designator
Aircraft identification

*Data block 1*
✓ Latitude, Longitude
✓ Level
✓ Time

*Data block 2*
✓ Wind direction, Wind speed
✓ Wind quality flag
✓ Air temperature
✓ Turbulence (if available)
✓ Humidity (if available)

*Data block 3*
✓ Condition prompting the issuance of a special air-report
  (e.g. SEV TURB, SEV ICE, SEV MTW, TS, VA CLD)

From ICAO ANNEX 3
Example:
ARS VA812 2020N07005W 1215 F180 MTW SEV

Meaning:
Special air-report from VIASA* flight number 812. Report refers to position 20 degrees 20 minutes north and 70 degrees 5 minutes west at 1215 UTC, at flight level 180. Severe mountain wave has been encountered.
* Fictitious operator

From ICAO Doc 8896
Elements of Special Air-reports (Voice Communications)

Message type designator

Section 1 (Position information)
✓ Aircraft identification
✓ Position or latitude and longitude
✓ Time
✓ Level or range of levels

Section 3 (Meteorological information)
✓ Condition prompting the issuance of a special air-report
Recording and post-flight reporting of aircraft observations of volcanic activity

- Special aircraft observations of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud shall be recorded on the special air-report of volcanic activity form.
- A copy of the form shall be included with the flight documentation provided to flights operating on routes which, in the opinion of the meteorological authority concerned, could be affected by volcanic ash clouds.

From ICAO ANNEX 3
Volcanic Activity Form

VOLCANIC ACTIVITY REPORT

Air reports are critically important in assessing the hazards which volcanic ash cloud presents to aircraft operations.

<table>
<thead>
<tr>
<th>OPERATOR:</th>
<th>ICA IDENTIFICATION: (as indicated on flight plan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PILOT-IN-COMMAND:</td>
<td></td>
</tr>
<tr>
<td>DEP FROM:</td>
<td>DATE:</td>
</tr>
<tr>
<td>ADDRESSEE</td>
<td></td>
</tr>
</tbody>
</table>

AIR REPORTS 1-8 are to be reported immediately to the ATSB unit that you are in contact with.

1) AIRCRAFT IDENTIFICATION
2) POSITION
3) TIME
4) FLIGHT LEVEL OR ALTITUDE
5) VOLCANIC ACTIVITY OBSERVED AT
   (position or bearing, estimated level of ash cloud and distance from aircraft)
6) AIR TEMPERATURE
7) SPOT WIND
8) SUPPLEMENTARY INFORMATION
   (brief description of activity, especially vertical and lateral extent of ash cloud and, where possible, horizontal movement, rate of growth, etc.)

After landing complete items 9-18 then fax form to: (Fax number to be provided by the meteorological authority based on local arrangements between the meteorological authority and the operator concerned.)

9) DENSITY OF ASH CLOUD
   (a) Wispy
   (b) Moderate dense
   (c) Very dense
10) COLOUR OF ASH CLOUD
    (a) White
    (d) Black
    (e) Other
11) ERUPTION
    (a) Continuous
    (b) Intermittent
    (c) Not visible
12) POSITION OF ACTIVITY
    (a) Summit
    (b) Side
    (c) Not observed
    (d) Multiple
13) OTHER OBSERVED FEATURES OF ERUPTION
    (a) Lightning
    (d) Ash fallout
    (e) Mushroom cloud
    (f) All
14) EFFECT ON AIRCRAFT
    (a) Communication
    (d) Pilot static
    (e) Windscreens
    (f) Windows
15) OTHER EFFECTS
    (a) Turbulence
    (b) St. Elme's Fire
    (c) Other

From ICAO Doc 4444 – PANS ATM
Responsibilities of MWOs

- The meteorological watch office shall transmit without delay the special air-reports received by voice communications to WAFCs.
- The meteorological watch office shall transmit without delay special air-reports of pre-eruption volcanic activity, a volcanic eruption or volcanic ash cloud received to the associated VAACs.
- When a special air-report is received at the meteorological watch office but the forecaster considers that the phenomenon causing the report is not expected to persist and, therefore, does not warrant issuance of a SIGMET, the special air-report shall be disseminated in the same way that SIGMET messages are disseminated.
Elements of Special Air-reports (Uplink)

✓ Message type designator
✓ Aircraft identification
✓ Phenomenon
✓ Observed time
✓ Location
✓ Level

➢ Special air-reports should be uplinked for 60 minutes after their issuance.
➢ Information on wind and temperature included in automated special air-reports should not be uplinked to other aircraft in flight.

From ICAO ANNEX 3
Example of a Special Air-reports (Uplink)

Example:
ARS VA812 SEV TURB OBS AT 1210Z N2706 W07306 FL180
Dissemination of Special Air-reports (Uplink)

- WMO header: $T_1T_2A_1A_2ii$ CCCC YYGGgg [CCx]
  - Data type designator ($T_1T_2$): UA
  - Level designator (ii):
    - 60-69 Special aircraft reports, except for volcanic ash
    - 70-79 Special aircraft reports, related to volcanic ash
- AFTN Priority indicator - FF

From the ICAO APAC ROBEX Handbook,
WMO – NO.386 Manual on the Global Telecommunication System
Further Information

- ICAO ANNEX 3
- ICAO Doc 4444: PANS ATM
- ICAO Doc 8896: Manual of Aeronautical Meteorological Practice
- ICAO APAC Regional SIGMET Guide
Utilization of Special Air-reports

- Monitoring of weather conditions
Utilization of Special Air-reports

SIGMET improvement – case studies
Utilization of Special Air-reports

- SIGMET improvement – NWP model input
Utilization of Special Air-reports

- SIGMET improvement – verification
Thank you!