International Civil Aviation Organization

SIXTEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND METEOROLOGY SUB-GROUP (CNS/MET SG/16) OF APANPIRG

Bangkok, Thailand, 23 – 27 July 2012

Agenda Item 12: Implementation of the issuance of OPMET (TAF, METAR, SPECI) Exchanges

3) other OPMET implementation issues

TIMELINESS, AVAILABILITY AND REGULARITY OF OPMET

(Presented by IATA)

SUMMARY

This paper summarizes the results of an OPMET data monitoring regarding timeliness, availability and regularity for the ASIAPAC region.

This paper relates to -

Strategic Objectives
A: Safety - *Enhance global civil aviation safety*
C: Environmental Protection and Sustainable Development of Air Transport - *Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

Global Plan Initiative:
GPI-19 Meteorological Systems

1. Introduction

1.1 ICAO Regional Office Bangkok asked IATA to support the monitoring of the timeliness and regularity of OPMET data from ASIAPAC.

1.2 In ICAO Annex 3, Appendix 10 required transit times for different OPMET Data types are described. In order to verify these transit times IATA is performing a continuous monitoring regarding timeliness and regularity of OPMET Data from the ASIAPAC region.

1.3 The IATA monitoring is considering various communication lines like SADIS, ISCS/WIFS and the German MET Office (DWD) as GTS/AFTN. The monitoring period was 16JUN2012 till 09JUL012 (21 days).

2. Discussion

2.1 The detailed results of the IATA monitoring are provided in Appendix 1 (METAR) and Appendix 2 (TAF) to this working paper. In detail the transmission time, the lead time and the regularity is listed for each monitored aerodrome in the ASIAPAC region.

2.2 The IATA monitoring considers always the first received and correct METAR or TAF, regardless through which data source it is received.

2.3 The IATA monitoring didn't separate the different data sources e.g. SADIS, ISCS/WIFS etc. However, the results give a good overview about timeliness and availability of OPMET data from each monitored aerodrome.

2.4 Both appendices show 5 columns:

ICAO Loc (4-letter airport identifier)

Mean Transmission Time
(Average time difference between observation time and reception time over a 21 days period)

MEAN Lead Time
(Average time difference between reception time and the commencement of the period of validity over a 21 days period, in case of SA it should be always zero)

Number of messages
(Number of received METARs/TAFs over a 21 days period, max number of expected METARs over 21 days is 504/1008 and for TAF 84)

ICAO Region

METAR

2.5 Timeliness of METAR

In the METAR worksheet all transmission times higher than 12 minutes are considered as not satisfactory (all red figures in the columns 'Mean Trans Time'). IATA expects that all METARs are available on the end user environment not later than 10 minutes after the observation time (Recommendation ICAO Annex 3, Appendix 10).

Over 21 days the METAR for PLCH has an average transmission time of more than 32 minutes.
Further it can be assumed that a transmission time lower than 3 minutes is an indicator that the METAR is distributed earlier than the mentioned observation time.

Over 21 days the METAR for NFFN has an average transmission time of less than one minute. This is really questionable. Due to the long distance communication it must be assumed that the METAR is issued before the mentioned observation time.

2.6 Regularity of METAR

The figures in the column 'Msg Nbr' are a good indicator for the regularity of METARs from the ASIAPAC region. Assuming that 24 METARs are issued per day for a location, the maximum number of expected METARs is 504 (21 day x 24 METAR).

In the tables all locations are marked red where the number in column 'Nbr' is lower than 200. This means that over a 21 days period less than 9 METARs are received per day in average.

Example: Over 21 days only 51 METARs for VQPR – PARO/INTL Bhutan has been received. A detailed analysis shows that the airport is closed for several hours. Therefore the full number of METARs cannot be expected. But for the rest of the day it is expected that hourly METARs are issued and distributed.

The analysis is based on a 9 week monitoring and is available for each weekday. Each day is split into 30 minutes periods where the numbers of received METARs are counted. The figure '9' means that METARs were received 9-times during the last 9 weeks during the 30 minutes period.

Values lower than 7 are a good indicator to show that the data are not received regular and that some investigations or clarifications are required.

Monday: VQPR SA I 9 0017 ...4.6.4.2.1.....

Tuesday: VQPR SA I 9 0027 .8.6.4...6.2.....1.....

Wednesday: VQPR SA I 9 0033 ...7.7.7.5.....7.....

Thursday: VQPR SA I 9 0036 .6.7.7.7.7.1.1.....

Friday: VQPR SA I 9 0026 .7.4.4.4.7.....

Saturday: VQPR SA I 9 0028 .3.5.7.5.7.1.....

Sunday: VQPR SA I 9 0021 .3.7.5.3.3.....

A number of more than 450 METARs over a 21 days period is considered as good. The difference can be caused by some possible interruptions in the reception of METAR.

For locations with 200 to 450 METARs over the 21 days period it can be assumed that these airports are not in operation for 24 hours.

The number of incorrect formatted METARs is neglectable.

2.7 Availability of METAR

The figures in the column 'Msg Nbr' are also a good indicator for the availability of METARs from the ASIAPAC region. Locations with less than 200 METARs over a period of 9 weeks should be investigated (operation, communication etc.). If the reason is based on operational issues then this should be mentioned in the remark of the FASID Table MET 2A in order to avoid false alarms.

2.8 Summary

The IATA monitoring of METAR from the ASIAPAC region shows that the majority of METARs are received at the end users environment within 12 minutes after observations. There are some location where the average transmission time is more than 20 minutes or less than 3 minutes. In both cases some investigations are requested to improve the timeliness.

Locations where the average transmission time is between 10 and 20 minutes are requested to reconsider their procedures for METAR issuance e.g. compilation time or acceleration of distribution.

For several airports less than 100 METARs are received during the 21 days monitoring period. The reasons are unknown.

TAF

2.9 Timeliness of TAF

In the TAF worksheet all transmission times higher than 30 minutes are considered as not satisfactory (all red figures in the columns 'Mean Trans Time'). IATA expects that all TAFs are available on the end user environment not later than 30 minutes after the promulgation time and not later than 30 minutes before the commencement of the period of validity.

Further it can be assumed that a transmission time lower than 10 minutes is an indicator that the TAF is distributed earlier than the mentioned promulgation time. In that case the issuing centre should reconsider their procedures.

Over 21 days the TAFs from Japan show a lead time (all red figures in the columns 'Mean Lead Time) have an average lead time of less than 2 minutes. This is caused by the fact that Japan is sending the TAF so late that it will not reach the end user before the commencement of the period of validity.

2.10 Regularity of TAF

The figures in the column 'Msg Nbr' are a good indicator for the regularity of TAFs from the ASIAPAC region. Assuming that 4 TAFs are issued per day for a location, the maximum number of expected TAFs is 84.

In the tables all locations are marked red where the number in column 'Msg Nbr' is lower than 15. Only two locations are found. All other airports are issuing TAFs quite regular.

2.11 Availability of TAF

The figures in the column 'Msg Nbr' are also a good indicator for the availability of TAFs from the ASIAPAC region. Locations with less than 20 TAFs over a period of 9 weeks should be investigated (operation, communication etc.). If the reason is based on operational issues then this should be mentioned in the remark of the FASID Table MET 2A in order to avoid false alarms.

2.12 Summary

The IATA monitoring of TAF from the ASIAPAC region shows that the average transmission time of TAFs does not give a clear picture. Many states are issuing TAFs some hours in advance and other distribute the TAF so late that it arrives after the effective time.

The requirement is that the TAF should be prepared not later than one hour before it becomes effective and that it should be distributed not later than 25 minutes before it becomes effective.

2.13 IATA is requesting some efforts by the group to improve the timeliness, regularity and availability of OPMET data on the SADIS and ISCS broadcast. The group may wish to formulate the following conclusion:

Draft Conclusion 16/.... — Time of Issuance and Distribution of TAF

That ICAO and the states concerned be invited

a) to establish procedures to issue aerodrome forecasts at a specific time not more than one hour before the commencement of the period of validity, and

b) to schedule the international exchange of aerodrome forecasts to be completed not later than 30 minutes before the commencement of the period of validity

Draft Conclusion 16/.... — Improvement of timeliness, regularity and availability of OPMET data on the SADIS and ISCS broadcast

That ICAO and the states concerned be invited

c) to continue the efforts for standardized procedures for the issuance of OPMET data, and

d) to consider the details provided in the IATA monitoring for the ASIAPAC region, and

e) to request all states concerned to improve the procedures for the issuance of OPMET data with respect to issuance time and communication

3. Action by the Meeting

3.1 The group is invited

a) to note results of the IATA OPMET data monitoring and information provided; and

b) to decide on the draft conclusions

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ICAO Loc	Mean Trans Time	Mean Lead Time	Msg Nbr	Region
AGGH	**0:13:55**	**0:00:00**	**342**	**ASI**
AYMH	**0:13:45**	**0:00:00**	**88**	**ASI**
AYMO	0:06:29	0:00:00	505	ASI
AYNZ	**0:13:01**	**0:00:00**	**124**	**ASI**
AYPY	0:05:55	0:00:03	369	ASI
AYVN	**0:15:33**	**0:00:00**	**40**	**ASI**
AYWK	**0:16:27**	**0:00:00**	**72**	**ASI**
NCRG	**0:14:18**	**0:00:02**	**490**	**PAC**
NFFN	**0:00:05**	**0:01:43**	**504**	**PAC**
NFNA	**0:01:45**	**0:00:53**	**481**	**PAC**
NFTF	**0:03:54**	**0:00:37**	**468**	**PAC**
NFTV	**0:03:26**	**0:01:08**	**368**	**PAC**
NGFU	**0:14:57**	**0:00:00**	**436**	**PAC**
NIUE	**0:02:24**	**0:00:18**	**141**	**PAC**
NSFA	**0:14:52**	**0:00:00**	**382**	**PAC**
NSTU	0:09:24	0:00:00	952	PAC
NTAA	0:02:56	0:00:00	996	PAC
NVVV	**0:07:07**	**0:00:00**	**3**	**ASI**
NWWW	0:01:17	0:00:00	1005	ASI
NZAA	0:10:19	0:00:00	501	ASI
NZCH	0:10:10	0:00:00	501	ASI
NZWN	0:10:15	0:00:00	501	ASI
OAKB	**0:19:28**	**0:00:01**	**501**	**ASI**
OAKN	0:30:56	0:00:00	505	ASI
OPKC	0:03:43	0:00:03	822	ASI
OPLA	0:05:13	0:00:00	838	ASI
OPMT	0:06:50	0:00:23	293	ASI
OPNH	0:01:01	0:00:02	410	ASI
OPPS	0:07:55	0:00:06	293	ASI
OPRN	0:05:07	0:00:02	420	ASI
PGRO	0:09:36	0:00:00	362	PAC
PGSN	0:06:02	0:00:00	522	PAC
PGUA	0:04:00	0:00:00	498	PAC
PGUM	0:04:54	0:00:00	557	PAC
PGWT	0:05:46	0:00:00	319	ASI
PHJH	0:09:51	0:00:00	269	PAC
PHKO	0:05:09	0:00:00	555	PAC
PHLI	0:05:30	0:00:00	599	PAC
PHMK	0:05:54	0:00:00	539	PAC
PHNL	0:05:05	0:00:00	513	PAC
PHNY	0:04:43	0:00:00	365	PAC
PHOG	0:05:49	0:00:00	519	PAC
PHTO	0:05:21	0:00:00	680	PAC
PKMJ	**0:09:21**	**0:00:00**	**109**	**PAC**
PKWA	0:02:30	0:00:00	1005	PAC
PLCH	**0:32:16**	**0:00:06**	**117**	**PAC**
PMDY	0:04:34	0:00:00	533	PAC
PTKK	0:06:15	0:00:00	500	PAC
PTPN	**0:21:34**	**0:00:12**	**174**	**PAC**
PTRO	0:09:51	0:00:36	496	PAC
PTSA	**0:08:15**	**0:03:07**	**85**	**PAC**
PTYA	0:08:41	0:00:00	498	PAC
PWAK	0:06:26	0:00:00	471	PAC
RCKH	0:06:45	0:00:00	879	ASI
RCSS	0:06:43	0:00:00	879	ASI

RCTP	0:07:44	0:00:00	1005	ASI
RJAA	0:07:41	0:00:00	1008	ASI
RJBB	0:07:49	0:00:00	1008	ASI
RJCC	0:07:54	0:00:00	1008	ASI
RJCH	0:07:45	0:00:00	294	ASI
RJFF	0:07:47	0:00:00	1005	ASI
RJFK	0:07:08	0:00:00	336	ASI
RJFO	0:07:16	0:00:00	315	ASI
RJFT	0:07:20	0:00:00	315	ASI
RJFU	0:07:09	0:00:00	315	ASI
RJGG	0:07:49	0:00:00	1008	ASI
RJOA	0:07:20	0:00:00	315	ASI
RJOB	0:07:24	0:00:00	315	ASI
RJOO	0:07:07	0:00:00	336	ASI
RJOT	0:07:23	0:00:00	315	ASI
RJSN	0:07:09	0:00:00	294	ASI
RJSS	0:07:11	0:00:00	336	ASI
RJTT	0:07:43	0:00:00	1008	ASI
RKJB	0:05:26	0:00:00	503	ASI
RKNY	0:05:26	0:00:00	504	ASI
RKPC	0:05:26	0:00:00	504	ASI
RKPK	0:08:51	0:00:00	471	ASI
RKSI	0:05:16	0:00:00	1008	ASI
RKSS	0:05:31	0:00:00	504	ASI
RKTN	0:10:05	0:00:00	471	ASI
RKTU	0:08:58	0:00:00	469	ASI
ROAH	0:07:44	0:00:00	1005	ASI
RPLB	0:10:35	0:00:00	423	ASI
RPLC	0:01:25	0:03:29	499	ASI
RPLI	0:09:04	0:00:00	267	ASI
RPLL	0:10:56	0:00:00	501	ASI
RPMD	**0:14:24**	**0:00:00**	**317**	**ASI**
RPMZ	0:09:27	0:00:00	300	ASI
RPVM	0:11:22	0:00:00	501	ASI
SCIP	0:03:57	0:00:00	502	PAC
TXKF	0:04:45	0:00:00	501	NAT
VAAH	**0:17:40**	**0:00:00**	**914**	**ASI**
VABB	**0:17:16**	**0:00:00**	**857**	**ASI**
VANP	**0:17:30**	**0:00:00**	**835**	**ASI**
VCBI	0:07:04	0:00:01	638	ASI
VDPP	0:01:52	0:01:33	731	ASI
VDSR	0:01:18	0:05:37	679	ASI
VECC	0:08:16	0:00:00	518	ASI
VEPT	**0:14:09**	**0:00:00**	**249**	**ASI**
VGEG	0:10:58	0:00:00	358	ASI
VHHH	0:04:22	0:00:00	1007	ASI
VIAR	**0:14:26**	**0:00:00**	**408**	**ASI**
VIBN	**0:16:49**	**0:00:00**	**290**	**ASI**
VIDP	**0:15:06**	**0:00:00**	**943**	**ASI**
VIJP	**0:14:56**	**0:00:00**	**522**	**ASI**
VILK	**0:16:04**	**0:00:00**	**700**	**ASI**
VLVT	0:09:26	0:00:00	490	ASI
VMMC	0:07:43	0:00:00	1003	ASI
VNKT	**0:23:12**	**0:00:00**	**224**	**ASI**
VOBL	0:01:49	0:00:00	991	ASI
VOCB	0:11:09	0:00:00	342	ASI

VOCI	0:06:50	0:00:00	861	ASI
VOCL	0:04:44	0:00:00	744	ASI
VOHS	**0:17:18**	**0:00:00**	**953**	**ASI**
VOHY	**0:17:56**	**0:00:00**	**287**	**ASI**
VOMM	**0:17:15**	**0:00:00**	**982**	**ASI**
VOTR	**0:17:31**	**0:00:00**	**928**	**ASI**
VOTV	**0:17:25**	**0:00:00**	**613**	**ASI**
VQPR	**0:12:43**	**0:00:00**	**51**	**ASI**
VRMM	**0:14:34**	**0:00:00**	**440**	**ASI**
VTBD	0:07:39	0:00:00	1003	ASI
VTBS	0:07:41	0:00:00	1000	ASI
VTBU	0:08:41	0:00:00	871	ASI
VTCC	0:08:32	0:00:00	974	ASI
VTCH	**0:20:45**	**0:00:00**	**185**	**ASI**
VTCL	**0:10:01**	**0:00:00**	**119**	**ASI**
VTCN	0:10:47	0:00:45	238	ASI
VTCP	**0:12:36**	**0:00:00**	**158**	**ASI**
VTCT	**0:13:59**	**0:00:00**	**324**	**ASI**
VTPH	0:11:18	0:00:00	252	ASI
VTPM	**0:10:31**	**0:00:00**	**81**	**ASI**
VTPO	0:11:43	0:00:00	246	ASI
VTPP	0:11:25	0:00:00	321	ASI
VTSB	0:10:05	0:00:00	323	ASI
VTSC	**0:10:10**	**0:00:00**	**107**	**ASI**
VTSE	**0:10:18**	**0:00:00**	**128**	**ASI**
VTSF	0:10:34	0:00:00	287	ASI
VTSG	0:16:01	0:00:00	201	ASI
VTSH	0:10:53	0:00:00	217	ASI
VTSM	0:10:06	0:00:00	360	ASI
VTSP	0:08:20	0:00:00	944	ASI
VTSS	0:08:15	0:00:00	994	ASI
VTST	**0:12:05**	**0:00:00**	**193**	**ASI**
VTUD	0:10:39	0:00:00	312	ASI
VTUI	**0:10:30**	**0:00:00**	**178**	**ASI**
VTUK	0:07:36	0:00:00	326	ASI
VTUL	**0:14:37**	**0:00:00**	**129**	**ASI**
VTUO	**0:15:37**	**0:00:00**	**23**	**ASI**
VTUU	0:08:18	0:00:06	499	ASI
VTUV	**0:07:14**	**0:00:05**	**127**	**ASI**
VTUW	0:11:33	0:00:00	233	ASI
VVDN	0:08:34	0:00:00	975	ASI
VVNB	0:07:43	0:00:00	1004	ASI
VVPB	0:09:05	0:00:00	960	ASI
VVTS	0:07:48	0:00:00	981	ASI
VYMD	**0:09:18**	**0:00:00**	**163**	**ASI**
VYYY	0:08:42	0:00:00	403	ASI
WAAA	0:04:00	0:00:00	990	ASI
WABB	**0:13:01**	**0:00:00**	**153**	**ASI**
WADD	0:11:22	0:00:00	920	ASI
WALL	0:12:11	0:00:00	560	ASI
WAMM	0:11:27	0:00:00	775	ASI
WAOO	**0:16:56**	**0:00:00**	**69**	**ASI**
WARR	**0:12:36**	**0:00:00**	**712**	**ASI**
WATT	**0:15:52**	**0:00:00**	**124**	**ASI**
WBGB	0:09:23	0:00:00	504	ASI
WBGG	0:09:04	0:00:00	1008	ASI

WBGR	0:09:41	0:00:00	504	ASI
WBGS	0:09:45	0:00:00	504	ASI
WBKK	0:09:03	0:00:00	1008	ASI
WBKL	0:09:45	0:00:00	504	ASI
WBKS	0:09:21	0:00:00	504	ASI
WBKW	0:10:04	0:00:00	504	ASI
WBSB	0:10:20	0:00:00	998	ASI
WIBB	0:11:34	0:00:00	239	ASI
WIDD	**0:11:53**	**0:00:00**	**183**	**ASI**
WIHH	**0:11:27**	**0:00:00**	**166**	**ASI**
WIII	0:03:25	0:00:01	1001	ASI
WIMM	0:12:02	0:00:00	917	ASI
WIOO	0:11:28	0:00:00	607	ASI
WIPP	0:11:27	0:00:00	445	ASI
WMKA	0:09:35	0:00:00	504	ASI
WMKB	0:09:21	0:00:00	504	ASI
WMKC	0:09:15	0:00:00	504	ASI
WMKD	0:09:42	0:00:00	504	ASI
WMKI	0:09:12	0:00:00	504	ASI
WMKJ	0:09:24	0:00:00	504	ASI
WMKK	0:09:20	0:00:00	1007	ASI
WMKL	0:09:58	0:00:00	503	ASI
WMKM	0:09:22	0:00:00	504	ASI
WMKN	0:09:51	0:00:00	503	ASI
WMKP	0:09:23	0:00:00	1008	ASI
WMSA	0:09:14	0:00:00	504	ASI
WSAP	0:03:10	0:00:00	399	ASI
WSSL	0:01:41	0:00:00	399	ASI
WSSS	0:02:11	0:00:00	1008	ASI
YAMB	0:09:35	0:00:00	985	ASI
YBAS	0:09:42	0:00:00	1007	ASI
YBBN	0:10:57	0:00:00	1001	ASI
YBCG	0:09:00	0:00:00	980	ASI
YBCS	0:11:11	0:00:00	999	ASI
YBRK	0:09:19	0:00:00	988	ASI
YBRM	0:09:13	0:00:00	996	ASI
YBTL	0:10:17	0:00:00	993	ASI
YCFS	0:11:22	0:00:00	999	ASI
YCIN	0:07:12	0:00:00	503	ASI
YFRT	0:07:15	0:00:00	504	ASI
YHID	0:11:40	0:00:00	971	ASI
YMAV	0:09:01	0:00:00	993	ASI
YMHB	0:09:15	0:00:00	996	ASI
YMLT	0:09:09	0:00:00	953	ASI
YMML	0:10:18	0:00:00	987	ASI
YPAD	0:10:56	0:00:00	979	ASI
YPCC	0:10:06	0:00:00	993	ASI
YPDN	0:13:57	0:00:00	1007	ASI
YPEA	0:05:54	0:00:00	502	ASI
YPKG	0:09:16	0:00:00	1003	ASI
YPLM	0:10:06	0:00:00	1001	ASI
YPPD	0:09:13	0:00:00	1001	ASI
YPPH	0:15:17	0:00:00	1000	ASI
YPTN	0:10:05	0:00:00	1005	ASI
YPWR	0:11:19	0:00:00	1003	ASI
YPXM	0:16:46	0:00:00	493	ASI

YSCB	0:11:05	0:00:00	985	ASI
YSDU	0:09:13	0:00:00	998	ASI
YSNF	0:09:30	0:00:00	986	ASI
YSRI	0:09:12	0:00:00	967	ASI
YSSY	0:11:13	0:00:00	991	ASI
YWLM	0:08:47	0:00:00	993	ASI
ZBAA	0:08:58	0:00:00	1008	ASI
ZBHH	0:09:59	0:00:00	504	ASI
ZBTJ	0:08:59	0:00:00	1008	ASI
ZBYN	0:08:59	0:00:00	1008	ASI
ZGGG	0:08:59	0:00:00	1008	ASI
ZGHA	0:09:52	0:00:00	504	ASI
ZGKL	0:09:30	0:00:00	504	ASI
ZGNN	0:09:29	0:00:00	504	ASI
ZGOW	0:09:30	0:00:00	504	ASI
ZGSZ	0:09:29	0:00:00	504	ASI
ZHHH	0:09:50	0:00:00	504	ASI
ZJHK	0:09:52	0:00:00	504	ASI
ZJSY	0:09:50	0:00:00	504	ASI
ZLLL	0:09:51	0:00:00	504	ASI
ZLXY	0:09:28	0:00:00	504	ASI
ZMUB	0:00:10	0:05:24	1002	ASI
ZPPP	0:09:29	0:00:00	504	ASI
ZSAM	0:09:29	0:00:00	504	ASI
ZSFZ	0:09:31	0:00:00	504	ASI
ZSHC	0:08:59	0:00:00	1008	ASI
ZSJN	0:02:28	0:00:00	504	ASI
ZSNJ	0:09:50	0:00:00	504	ASI
ZSOF	0:09:52	0:00:00	504	ASI
ZSPD	0:08:59	0:00:00	1008	ASI
ZSQD	0:09:29	0:00:00	504	ASI
ZSSS	0:08:59	0:00:00	1008	ASI
ZUCK	0:09:52	0:00:00	503	ASI
ZUUU	0:09:29	0:00:00	503	ASI
ZWSH	0:09:00	0:00:00	644	ASI
ZWWW	0:08:59	0:00:00	1008	ASI
ZYCC	0:09:51	0:00:00	504	ASI
ZYHB	0:09:51	0:00:00	504	ASI
ZYTL	0:09:00	0:00:00	1008	ASI
ZYTX	0:09:01	0:00:00	1008	ASI

ICAO Loc	Mean Trans Time	Mean Lead Time	Msg Nbr	Region
AGGH	**1:24:23**	**1:22:50**	**71**	**ASI**
ANYN	**1:24:51**	**1:25:21**	**72**	**PAC**
AYMH	**1:22:49**	**1:28:23**	**35**	**ASI**
AYMO	**1:22:53**	**1:10:03**	**45**	**ASI**
AYNZ	**1:16:15**	**0:58:59**	**48**	**ASI**
AYPY	**1:29:18**	**1:23:55**	**70**	**ASI**
AYVN	**1:24:09**	**1:28:56**	**38**	**ASI**
AYWK	**1:10:13**	**1:27:54**	**47**	**ASI**
NCRG	**0:04:54**	**2:03:08**	**79**	**PAC**
NFFN	**0:04:55**	**2:02:53**	**78**	**PAC**
NFNA	**0:07:19**	**1:54:52**	**82**	**PAC**
NFTF	**0:07:00**	**2:00:32**	**81**	**PAC**
NFTV	**0:08:03**	**1:55:54**	**84**	**PAC**
NGFU	**0:02:55**	**1:56:22**	**65**	**PAC**
NGTA	**0:03:30**	**1:59:49**	**84**	**PAC**
NIUE	**0:08:16**	**1:55:52**	**82**	**PAC**
NLWW	**0:02:39**	**1:24:15**	**84**	**PAC**
NSFA	**0:08:16**	**1:57:07**	**82**	**PAC**
NSTU	0:04:10	0:26:13	85	PAC
NTAA	**0:02:14**	**1:20:34**	**85**	**PAC**
NVSS	**0:06:08**	**1:37:28**	**84**	**ASI**
NVVV	**0:05:39**	**1:37:38**	**83**	**ASI**
NWWW	**0:02:39**	**1:24:15**	**84**	**ASI**
NZAA	**0:02:32**	**1:00:59**	**85**	**ASI**
NZCH	**0:03:27**	**1:01:40**	**84**	**ASI**
NZWN	**0:02:08**	**1:01:40**	**84**	**ASI**
OAKB	0:19:34	0:38:33	84	ASI
OAKN	0:17:32	0:52:28	82	ASI
OPGD	**0:13:06**	**2:09:03**	**80**	**ASI**
OPKC	**0:11:42**	**2:07:46**	**82**	**ASI**
OPLA	**0:26:24**	**1:47:56**	**66**	**ASI**
OPMT	**0:32:25**	**1:46:47**	**73**	**ASI**
OPNH	**0:13:22**	**2:06:55**	**83**	**ASI**
OPPS	**0:30:54**	**2:02:43**	**63**	**ASI**
OPRN	**0:51:22**	**1:41:38**	**69**	**ASI**
PGRO	0:02:24	0:22:13	72	PAC
PGSN	0:02:27	0:31:52	84	PAC
PGUA	0:12:57	0:00:09	65	PAC
PGUM	0:02:26	0:31:53	84	PAC
PGWT	0:02:32	0:20:55	64	ASI
PHJH	0:02:27	0:27:34	42	PAC
PHKO	0:02:23	0:28:09	84	PAC
PHLI	0:02:20	0:28:11	84	PAC
PHMK	0:02:22	0:28:09	84	PAC
PHNL	0:02:23	0:27:30	86	PAC
PHNY	0:02:23	0:28:08	84	PAC
PHOG	0:02:25	0:28:05	84	PAC
PHTO	0:02:23	0:28:08	84	PAC
PKMJ	0:02:27	0:31:52	84	PAC
PKWA	0:02:29	0:31:50	84	PAC
PLCH	**0:04:14**	**1:58:16**	**82**	**PAC**
PMDY	0:02:24	0:28:07	84	PAC
PTKK	0:02:27	0:31:53	84	PAC
PTPN	0:02:20	0:16:48	49	PAC
PTRO	0:02:27	0:31:53	84	PAC

PTSA	0:02:28	0:08:10	27	PAC
PTYA	0:02:27	0:31:52	84	PAC
RCKH	**0:00:24**	**1:08:18**	**84**	**ASI**
RCSS	**0:00:30**	**1:07:09**	**84**	**ASI**
RCTP	**0:00:24**	**1:08:18**	**84**	**ASI**
RJAA	0:07:08	0:10:42	84	ASI
RJBB	0:05:08	0:14:10	84	ASI
RJCC	**0:19:27**	**0:01:27**	**84**	**ASI**
RJCH	**0:12:29**	**0:01:32**	**84**	**ASI**
RJFF	**0:15:05**	**0:01:27**	**84**	**ASI**
RJFK	**0:16:34**	**0:01:27**	**84**	**ASI**
RJFO	**0:13:13**	**0:01:22**	**84**	**ASI**
RJFT	**0:12:00**	**0:01:25**	**84**	**ASI**
RJFU	**0:13:34**	**0:01:25**	**84**	**ASI**
RJGG	**0:11:51**	**0:01:27**	**84**	**ASI**
RJOA	**0:17:12**	**0:01:24**	**84**	**ASI**
RJOB	**0:16:58**	**0:01:23**	**84**	**ASI**
RJOO	**0:15:39**	**0:01:33**	**84**	**ASI**
RJOT	**0:16:20**	**0:01:23**	**84**	**ASI**
RJSN	**0:17:06**	**0:01:26**	**84**	**ASI**
RJSS	**0:14:55**	**0:01:32**	**84**	**ASI**
RJTT	**0:17:08**	**0:01:33**	**84**	**ASI**
RKJB	0:06:17	0:53:13	85	ASI
RKNY	0:06:24	0:53:35	84	ASI
RKPC	0:07:37	0:52:22	84	ASI
RKPK	0:16:12	0:44:34	83	ASI
RKSI	0:06:43	0:52:39	85	ASI
RKSS	0:07:14	0:52:45	83	ASI
RKTN	0:16:30	0:48:20	81	ASI
RKTU	0:13:07	0:47:00	80	ASI
ROAH	**0:19:44**	**0:01:32**	**84**	**ASI**
RPLB	**0:04:50**	**1:29:10**	**81**	**ASI**
RPLC	**0:02:49**	**1:29:18**	**83**	**ASI**
RPLI	**0:02:45**	**1:29:20**	**83**	**ASI**
RPLL	**0:02:48**	**1:29:20**	**82**	**ASI**
RPMD	**0:02:47**	**1:29:28**	**82**	**ASI**
RPML	**0:04:12**	**1:28:41**	**83**	**ASI**
RPMR	**0:03:11**	**1:28:56**	**83**	**ASI**
RPMZ	**0:02:52**	**1:29:15**	**83**	**ASI**
RPVD	**0:02:49**	**1:29:17**	**83**	**ASI**
RPVM	**0:02:51**	**1:29:04**	**83**	**ASI**
RPVP	**0:02:50**	**1:29:06**	**82**	**ASI**
SCIP	**0:08:13**	**1:17:04**	**62**	**PAC**
VAAH	**2:10:15**	**0:53:10**	**77**	**ASI**
VABB	**2:16:12**	**0:49:10**	**85**	**ASI**
VANP	**2:12:30**	**0:50:20**	**82**	**ASI**
VCBI	**0:10:32**	**2:08:23**	**72**	**ASI**
VDPP	0:12:12	0:48:42	80	ASI
VDSR	0:13:09	0:47:49	81	ASI
VECC	**1:01:05**	**2:02:54**	**79**	**ASI**
VEGT	**3:05:02**	**0:37:46**	**53**	**ASI**
VEGY	**2:04:35**	**0:55:25**	**1**	**ASI**
VEPT	**2:16:52**	**1:03:41**	**54**	**ASI**
VGEG	**0:49:56**	**2:04:12**	**75**	**ASI**
VHHH	0:04:55	0:55:04	84	ASI
VIAR	**0:52:23**	**2:06:49**	**81**	**ASI**

VIBN	**0:54:08**	**2:08:01**	**82 ASI**
VIDP	**0:54:06**	**2:06:22**	**84 ASI**
VIJP	**1:01:02**	**2:01:19**	**88 ASI**
VILK	**0:49:28**	**2:12:38**	**83 ASI**
VLLB	0:30:25	0:48:40	51 ASI
VLLN	**0:40:54**	**0:48:11**	**52 ASI**
VLPS	**0:36:49**	**0:58:53**	**50 ASI**
VLSK	0:30:05	0:49:28	50 ASI
VLVT	0:27:02	0:51:49	56 ASI
VMMC	0:05:03	0:54:55	84 ASI
VNKT	**1:36:22**	**1:26:55**	**44 ASI**
VOBL	**0:01:55**	**3:16:32**	**84 ASI**
VOCB	**0:07:10**	**2:57:15**	**85 ASI**
VOCI	**2:08:57**	**0:51:02**	**84 ASI**
VOCL	**2:10:24**	**0:49:43**	**84 ASI**
VOHS	**0:11:59**	**2:45:07**	**85 ASI**
VOHY	**1:51:45**	**1:08:14**	**4 ASI**
VOML	**0:01:39**	**3:16:57**	**84 ASI**
VOMM	**0:11:04**	**2:54:15**	**85 ASI**
VOTR	**0:10:51**	**2:53:35**	**85 ASI**
VOTV	**2:07:30**	**0:50:35**	**83 ASI**
VRMG	0:23:52	0:42:53	78 ASI
VRMM	0:24:07	0:42:41	78 ASI
VTBD	0:06:40	0:52:59	84 ASI
VTBS	0:07:10	0:52:49	84 ASI
VTBU	0:08:21	0:51:04	84 ASI
VTCC	0:05:30	0:55:55	83 ASI
VTCH	0:07:20	0:55:26	41 ASI
VTCL	0:07:01	0:55:45	41 ASI
VTCN	0:07:01	0:55:45	41 ASI
VTCP	0:07:01	0:55:45	41 ASI
VTCT	0:06:03	0:55:17	83 ASI
VTPB	0:07:01	0:55:44	41 ASI
VTPM	0:07:02	0:55:37	42 ASI
VTPO	0:07:02	0:55:37	42 ASI
VTPP	0:07:01	0:55:45	41 ASI
VTPT	0:07:02	0:55:37	42 ASI
VTSB	0:15:43	0:44:27	39 ASI
VTSC	0:15:53	0:44:16	39 ASI
VTSE	**0:40:40**	**0:41:47**	**39 ASI**
VTSF	0:14:53	0:45:16	39 ASI
VTSG	0:21:01	0:43:05	81 ASI
VTSH	0:24:52	0:43:06	39 ASI
VTSK	0:15:03	0:45:06	39 ASI
VTSM	0:15:04	0:45:28	39 ASI
VTSP	0:20:26	0:43:41	82 ASI
VTSR	0:17:48	0:43:27	38 ASI
VTSS	0:12:35	0:48:19	79 ASI
VTST	0:18:24	0:42:47	40 ASI
VTUD	0:14:00	0:50:38	83 ASI
VTUI	0:13:59	0:52:55	41 ASI
VTUK	0:13:57	0:50:42	83 ASI
VTUL	0:13:59	0:52:55	41 ASI
VTUO	0:07:08	0:58:55	42 ASI
VTUQ	0:07:12	0:58:40	42 ASI
VTUU	0:06:38	0:56:32	83 ASI

VTUV	0:07:12	0:58:40	42 ASI
VTUW	0:12:54	0:53:51	40 ASI
VVDN	0:08:04	0:51:54	82 ASI
VVNB	0:13:49	0:46:36	76 ASI
VVPB	0:08:21	0:51:37	82 ASI
VVTS	0:10:01	0:51:00	82 ASI
VYMD	**0:33:10**	**0:28:16**	**30 ASI**
VYYY	0:28:30	0:44:29	60 ASI
WAAA	**0:04:02**	**1:32:17**	**84 ASI**
WABB	0:08:45	0:52:52	83 ASI
WADD	0:13:53	0:52:28	83 ASI
WALL	**0:44:16**	**0:29:41**	**71 ASI**
WAMM	**0:39:47**	**0:43:50**	**74 ASI**
WAOO	**1:39:04**	**0:24:57**	**25 ASI**
WAPP	**0:42:40**	**0:33:15**	**81 ASI**
WARR	**2:06:41**	**0:50:49**	**81 ASI**
WATT	**0:58:46**	**0:28:53**	**67 ASI**
WBGB	**1:01:37**	**1:58:22**	**84 ASI**
WBGG	**2:08:17**	**0:49:37**	**84 ASI**
WBGR	**1:01:37**	**1:58:21**	**84 ASI**
WBGS	**1:01:48**	**1:58:10**	**84 ASI**
WBKK	**2:06:48**	**0:49:40**	**83 ASI**
WBKL	**1:01:00**	**1:56:52**	**83 ASI**
WBKS	**1:00:56**	**1:57:51**	**84 ASI**
WBKW	**1:01:38**	**1:58:20**	**84 ASI**
WBSB	0:16:03	0:49:06	84 ASI
WIBB	**1:06:04**	**0:20:35**	**37 ASI**
WIDD	**0:09:33**	**1:17:11**	**77 ASI**
WIHH	0:11:47	0:49:37	68 ASI
WIII	**0:04:24**	**1:33:36**	**84 ASI**
WIMM	**0:39:55**	**1:22:14**	**77 ASI**
WIPP	**0:55:18**	**0:31:04**	**59 ASI**
WMKA	**1:01:40**	**1:58:18**	**84 ASI**
WMKB	**1:01:37**	**1:58:21**	**84 ASI**
WMKC	**1:01:19**	**1:58:18**	**84 ASI**
WMKD	**1:01:15**	**1:58:15**	**84 ASI**
WMKE	**1:01:40**	**1:58:18**	**84 ASI**
WMKI	**1:01:40**	**1:58:18**	**84 ASI**
WMKJ	**2:08:15**	**0:51:43**	**84 ASI**
WMKK	**2:08:15**	**0:51:43**	**84 ASI**
WMKL	**1:01:38**	**1:58:21**	**84 ASI**
WMKM	**1:01:38**	**1:58:20**	**84 ASI**
WMKN	**1:01:19**	**1:58:18**	**84 ASI**
WMKP	**2:08:15**	**0:51:44**	**82 ASI**
WMSA	**2:08:15**	**0:51:43**	**84 ASI**
WSAP	0:06:02	0:53:56	84 ASI
WSSL	0:06:02	0:53:56	84 ASI
WSSS	0:06:02	0:53:56	84 ASI
YAMB	0:04:05	1:02:33	81 ASI
YBAS	0:02:00	1:30:20	84 ASI
YBBN	0:02:03	1:23:42	83 ASI
YBCG	0:02:37	1:19:21	84 ASI
YBCS	0:02:06	1:11:53	85 ASI
YBRK	0:02:16	1:40:12	82 ASI
YBRM	0:01:48	1:32:59	84 ASI
YBTL	0:02:07	1:07:49	82 ASI

YCFS	0:01:46	1:11:07	84 ASI
YCIN	0:01:57	1:38:34	84 ASI
YFRT	0:01:56	1:31:42	84 ASI
YHID	0:02:04	1:12:06	83 ASI
YMAV	0:02:26	1:18:05	83 ASI
YMHB	0:01:46	1:15:56	83 ASI
YMLT	0:01:44	1:06:50	84 ASI
YMML	0:01:45	1:27:20	81 ASI
YPAD	0:07:25	0:56:09	85 ASI
YPCC	0:01:48	1:27:08	84 ASI
YPDN	0:01:48	1:33:04	84 ASI
YPEA	0:01:50	1:12:53	83 ASI
YPKG	0:01:49	1:33:47	82 ASI
YPLM	0:01:53	1:33:02	84 ASI
YPPD	0:01:46	1:32:22	85 ASI
YPPH	0:01:55	1:28:10	80 ASI
YPTN	0:01:47	1:33:40	84 ASI
YPWR	0:01:47	0:58:16	83 ASI
YPXM	0:01:48	1:29:12	84 ASI
YSCB	0:01:53	0:52:42	85 ASI
YSDU	0:01:55	1:03:05	81 ASI
YSNF	0:01:48	1:07:05	85 ASI
YSRI	0:01:57	1:01:24	81 ASI
YSSY	0:01:50	1:20:34	86 ASI
YWLM	0:01:53	1:03:33	86 ASI
ZBAA	**1:29:03**	**0:53:28**	**84 ASI**
ZBHH	**2:09:03**	**0:52:26**	**84 ASI**
ZBTJ	**1:45:22**	**0:53:28**	**84 ASI**
ZBYN	**2:14:26**	**0:53:20**	**84 ASI**
ZGGG	**1:57:09**	**0:53:28**	**84 ASI**
ZGHA	**2:32:57**	**0:52:21**	**84 ASI**
ZGKL	**2:09:56**	**0:52:32**	**84 ASI**
ZGNN	**1:57:55**	**0:52:43**	**84 ASI**
ZGOW	**1:47:43**	**0:52:43**	**84 ASI**
ZGSZ	**2:06:51**	**0:52:43**	**84 ASI**
ZHHH	**2:56:19**	**0:52:26**	**84 ASI**
ZJHK	**1:55:11**	**0:52:26**	**84 ASI**
ZJSY	**1:45:31**	**0:52:26**	**84 ASI**
ZKPY	**0:06:41**	**2:33:59**	**42 ASI**
ZLLL	**1:54:10**	**0:52:26**	**84 ASI**
ZLXY	**1:35:36**	**0:52:43**	**84 ASI**
ZMUB	**0:08:23**	**1:12:51**	**83 ASI**
ZPPP	**3:41:44**	**0:52:03**	**79 ASI**
ZSAM	**1:28:33**	**0:52:42**	**84 ASI**
ZSFZ	**1:45:51**	**0:52:34**	**84 ASI**
ZSHC	**2:15:46**	**0:53:28**	**84 ASI**
ZSNJ	**1:51:53**	**0:52:25**	**83 ASI**
ZSOF	**2:06:58**	**0:52:25**	**84 ASI**
ZSPD	**1:28:25**	**0:53:28**	**84 ASI**
ZSQD	**1:38:25**	**0:52:42**	**84 ASI**
ZSSS	**1:30:37**	**0:53:28**	**84 ASI**
ZUCK	**2:20:41**	**0:52:25**	**84 ASI**
ZUUU	**1:52:35**	**0:52:43**	**84 ASI**
ZWSH	**1:39:50**	**0:52:42**	**81 ASI**
ZWWW	**1:44:43**	**0:53:28**	**84 ASI**
ZYCC	**1:57:26**	**0:52:10**	**82 ASI**

ZYHB	**1:50:16**	**0:52:13**	**84 ASI**
ZYTL	**1:53:56**	**0:53:28**	**84 ASI**
ZYTX	**2:41:19**	**0:53:27**	**84 ASI**