COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMME AREA GROUP
ON INTEGRATED OBSERVING SYSTEMS

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EXPERT TEAM ON AIRCRAFT-BASED OBSERVING SYSTEMS

FIRST SESSION

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STATUS OF THE AIRCRAFT-BASED OBSERVATIONS PROGRAMS

Reports of Operational National & Regional Programs

(*Submitted by Hong Kong, China*)

SUMMARY AND PURPOSE OF DOCUMENT

Provides a status report on the national/regional AMDAR Program of Hong Kong, China.

ACTION PROPOSED

The Session is invited to note the information contained in the document.

Appendices

1. Program Metadata

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PROGRESS AND ACTIVITY REPORT

Current Status

1.   Six B-747 aircraft of the Cathay Pacific Airways continued to provide AMDAR data to the AMDAR programme of Hong Kong, China in the past year.   The average number of AMDAR observations received at the Hong Kong International Airport (HKIA) stayed at around 1,000 per day.

2.   AMDAR data from Hong Kong, China are now disseminated on GTS in BUFR format.

3.   Apart from providing actual wind information along flight path and supporting aviation weather forecasting at HKIA, the high-resolution AMDAR data are also utilized for identification of windshear.

4.   AMDAR data received from GTS are ingested into the 3-dimensional variational data assimilation (3DVAR) system of the mesoscale numerical weather prediction (NWP) model of the Hong Kong Observatory, namely the Non-Hydrostatic Model (NHM), to improve wind and temperature analyses in the model initial condition. The horizontal resolution of NHM is 10 km, with model run and analysis updated every 3 hours to provide forecast up to 72 hours ahead.

Development & Other Activities

5.   From June 2011, reconnaissance flights have been conducting in collaboration with the Government Flying Service of Hong Kong, China to collect upper-air data of tropical cyclones (TCs) within the Hong Kong Flight Information Region (HKFIR).   The flight observations are used to analyse position, intensity and the meteorological conditions such as winds, temperature, humidity and pressure around TCs.   Data impact experiments have also been performed to ingest the additional flight data into NHM, in which improvements are found in model initial condition and forecast track of TCs.

Future Plans

6.   While Hong Kong, China is working towards expanding its AMDAR programme to include airbus aircrafts last year, difficulties were encountered with regard to the older version of AMDAR software being installed on the fleet and the charging mechanism to downlink the AMDAR data of the local airline concerned. Hong Kong, China is looking forward to invite other local airlines to participate in the programme.

APPENDIX 1

PROGRAM METADATA

Operational Fleet

Airline	Country of Airline	Aircraft Type (e.g. B737-400)	Number of Aircraft	AMDAR Software	Format On GTS (BUFR / FM42)
Cathay Pacific Airways	Hong Kong, China	B747-400	6	ARINC 620/3 Version 2	BUFR

Program Coverage

[If possible, provide here a summary estimate of the national or regional AMDAR program coverage as at July 2013. Indicate in the last column which measure is being used as necessary. Information should ideally be based on 1 month of data.]

Airport Country	Airport Name	Airport ID (IATA)	Profiles per day/week* (wind and temperature)	
			Ascending Profiles	Descending Profiles
Hong Kong, China	Hong Kong International Airport, Hong Kong	HKG	About 163 per month	About 165 per month
China	Beijing Capital International Airport, Beijing	PEK	About 12 per month	About 10 per month
China	Shanghai Pudong International Airport, Shanghai	PVG	About 6 per month	About 6 per month
Germany	Frankfurt International Airport, Frankfurt	FRA	About 15 per month	About 15 per month
Indonesia	Juanda International Airport, Surabaya	SUB	About 2 per month	About 2 per month
Indonesia	Ngurah Rai International Airport, Denpasar Bali	DPS	About 2 per month	About 2 per month
Japan	Haneda Airport, Tokyo	HND	About 9 per month	About 8 per month
Japan	Kansai International Airport, Osaka	KIX	About 4 per month	About 4 per month
Japan	Narita International Airport, Tokyo	NRT	About 6 per month	About 6 per month
Japan	New Chitose Airport, Sapporo	CTS	About 10 per month	About 10 per month
Korea	Incheon International Airport, Seoul	ICN	About 5 per month	About 5 per month
Philippines	Ninoy Aquino International Airport, Manila	MNL	About 13 per month	About 13 per month
Singapore	Changi Airport, Singapore	SIN	About 10 per month	About 10 per month
South Africa	Oliver Reginald Tambo International Airport, Johannesburg	JNB	About 8 per month	About 8 per month
Taiwan	Taiwan Taoyuan International Airport, Taipei	TPE	About 31 per month	About 31 per month

Thailand	Suvarnabhumi International Airport, Bangkok	BKK	About 4 per month	About 4 per month
United Kingdom	London Heathrow Airport, London	LHR	About 12 per month	About 12 per month
United States	San Francisco International Airport, San Francisco	SFO	About 15 per month	About 14 per month
Vietnam	Tan Son Nhat International Airport, Ho Chi Minh City	SGN	About 1 per month	About 1 per month

* The number of profiles was based on the average in July 2013.

Program Potential Coverage

[If possible, provide here a summary estimate of the national, international or regional AMDAR program *potential* coverage as at July 2013. Data should be provided here only for airports that are able to be serviced by the ***existing operational national or regional AMDAR fleets*** (i.e. enabled through configuration or optimisation control alteration) and only for those airports **not** listed under Program Coverage. Information should ideally be based on 1 month of data.]

Airport Country	Airport Name	Airport ID (IATA)	Profiles per day/week
N/A	N/A	N/A	N/A

Notes

All inbound and outbound flights of Hong Kong, China are International flights.

Program Potential International Coverage

[If possible, provide here a summary estimate of the ***international*** AMDAR program ***potential*** coverage as at July 2013. Data should be provided here for airports that are able to be serviced by the equipping of international-operating aircraft within the fleets of ***existing*** AMDAR partner airlines (i.e. enabled through implementation of AMDAR software for the aircraft fleet) and only for those airports **not** listed under Program Coverage and Program Potential Coverage. Information should ideally be based on 1 month of data.]

Airport Country	Airport Name	Airport ID (IATA)	Airline & Fleet (Aircraft model)	Estimated profiles per week*
Australia	Adelaide International Airport, Adelaide	ADL	Cathay Pacific Airways, A330	7 x 2
Australia	Brisbane International Airport, Brisbane	BNE	Cathay Pacific Airways, A330	11 x 2
Australia	Cairns Airport, Cairns	CNS	Cathay Pacific Airways, A330	7 x 2
Australia	Melbourne Airport, Melbourne	MEL	Cathay Pacific Airways, A330	21 x 2
Australia	Perth International Airport, Perth	PER	Cathay Pacific Airways, A330	10 x 2
Australia	Sydney (Kingsford Smith) Airport, Sydney	SYD	Cathay Pacific Airways, A330	28 x 2
Bahrain	Bahrain International Airport, Bahrain	BAH	Cathay Pacific Airways, A330	4 x 2
Canada	Toronto Lester B. Pearson International Airport, Toronto	YYZ	Cathay Pacific Airways, B777	10 x 2
Canada	Vancouver International	YVR	Cathay Pacific Airways,	14 x 2

	Airport, Vancouver		B777	
France	Charles De Gaulle Airport, Paris	CDG	Cathay Pacific Airways, A343 and B777	12 x 2
India	Chennai International Airport, Chennai	MAA	Cathay Pacific Airways, A330	7 x 2
India	Indira Gandhi International Airport, Delhi	DEL	Cathay Pacific Airways, A330	14 x 2
India	Rajiv Gandhi International Airport, Hyderabad	HYD	Cathay Pacific Airways, A330	4 x 2
India	Chhatrapati Shivaji International Airport, Mumbai	BOM	Cathay Pacific Airways, A330 and fleet varies	10 x 2
Indonesia	Soekarno-Hatta International Airport, Jakarta	CGK	Cathay Pacific Airways, Fleet varies	21 x 2
Italy	Milan Malpensa Airport, Milan (subject to Government Approval)	MXP	Cathay Pacific Airways, B777	7 x 2
Italy	Leonardo da Vinci International (Fiumicino) Airport, Rome	FCO	Cathay Pacific Airways, A343	6 x 2
Japan	Fukuoka Airport, Fukuoka	FUK	Cathay Pacific Airways, fleet varies	7 x 2
Japan	Chubu Centrair International Airport, Nagoya	NGO	Cathay Pacific Airways, A343 and fleet varies	20 x 2
Malaysia	Kuala Lumpur International Airport, Kuala Lumpur	KUL	Cathay Pacific Airways, A330, B737 and fleet varies	26 x 2
Malaysia	Penang International Airport, Penang	PEN	Cathay Pacific Airways, fleet varies	10 x 2
Netherlands	Amsterdam Schiphol Airport, Amsterdam	AMS	Cathay Pacific Airways, A343	7 x 2
New Zealand	Auckland International Airport, Auckland	AKL	Cathay Pacific Airways, A343	7 x 2
Pakistan	Jinnah International Airport, Karachi	KHI	Cathay Pacific Airways, A330	4 x 2
Philippines	Mactan-Cebu International Airport, Cebu	CEB	Cathay Pacific Airways, Fleet varies	7 x 2
Russia	Moscow Domodedovo Airport, Moscow	DME	Cathay Pacific Airways, A343	3 x 2
Saudi Arabia	King Abdulaziz International Airport, Jeddah,	JED	Cathay Pacific Airways, A330	7 x 2
Saudi Arabia	King Khalid International Airport, Riyadh	RUH	Cathay Pacific Airways, A330	7 x 2
Sri Lanka	Bandaranayake Airport, Colombo	CMB	Cathay Pacific Airways, B777	7 x 2
United Arab Emirates	Abu Dhabi International Airport, Abu Dhabi	AUH	Cathay Pacific Airways, A330	3 x 2
United Arab Emirates	Dubai International Airport, Dubai	DXB	Cathay Pacific Airways, A330	14 x 2
United States	Chicago O'Hare International Airport, Chicago	ORD	Cathay Pacific Airways, B777	7 x 2
United States	Los Angeles International Airport, Los Angeles	LAX	Cathay Pacific Airways, B777	20 x 2
United States	John F. Kennedy International Airport, New York	JFK	Cathay Pacific Airways, B777	25 x 2

* Include ascending and descending profiles

Notes

The above estimates are based on the airports from which Cathay Pacific are currently operating.   It should be note that most of Cathay Pacific's aircrafts are currently not involved in the AMDAR programme.