



# **Civil Aviation Department**

## ***Environmental Report 2012***

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# Foreword

This Environmental Report reviews our performance in 2012. It is the 14<sup>th</sup> report in the series.

CAD is committed to a safe, efficient and sustainable air transport system in Hong Kong. We also strive to minimize the disturbance caused by aircraft operations to the local communities and to implement green measures in our offices to protect the environment.

In managing aircraft noise, we follow the “Balanced Approach” recommended by the International Civil Aviation Organization<sup>1</sup> (ICAO). The goal is to address the local noise problem in the most cost-effective manner by identifying the noise problem at an airport and then analyzing the various measures available to reduce noise using elements such as:

- Reducing noise at source
- Implementing noise abatement operational procedures
- Imposing operating restrictions on aircraft

We have implemented various aircraft noise mitigating measures as stated in the report and will continue to review, develop and implement any feasible measures in the light of development of international standards and recommended practices in aircraft noise management and in the field of environmental protection.

In green housekeeping, we continue to keep a close watch on the consumption of electricity, paper and other materials and aim to reduce their consumption as far as practicable.

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<sup>1</sup> The International Civil Aviation Organization (ICAO) is a specialized agency of the United Nations. ICAO was established in 1944 to promote the safe and orderly development of international civil aviation. It sets standards and regulations necessary for aviation safety, security, efficiency and regularity, as well as for aviation environmental protection. The organization serves as the forum for cooperation in all fields of civil aviation among its 191 Contracting States.

# Chapter 1 – Environmental Management

We are aware of the impacts that the daily aircraft and office operations can bring to the environment, therefore it is of the utmost importance to ensure care of the environment in our everyday business.

The environmental management at our department could be classified into two areas:

- Aircraft Noise Management
- Green Housekeeping

## *Aircraft Noise Management*

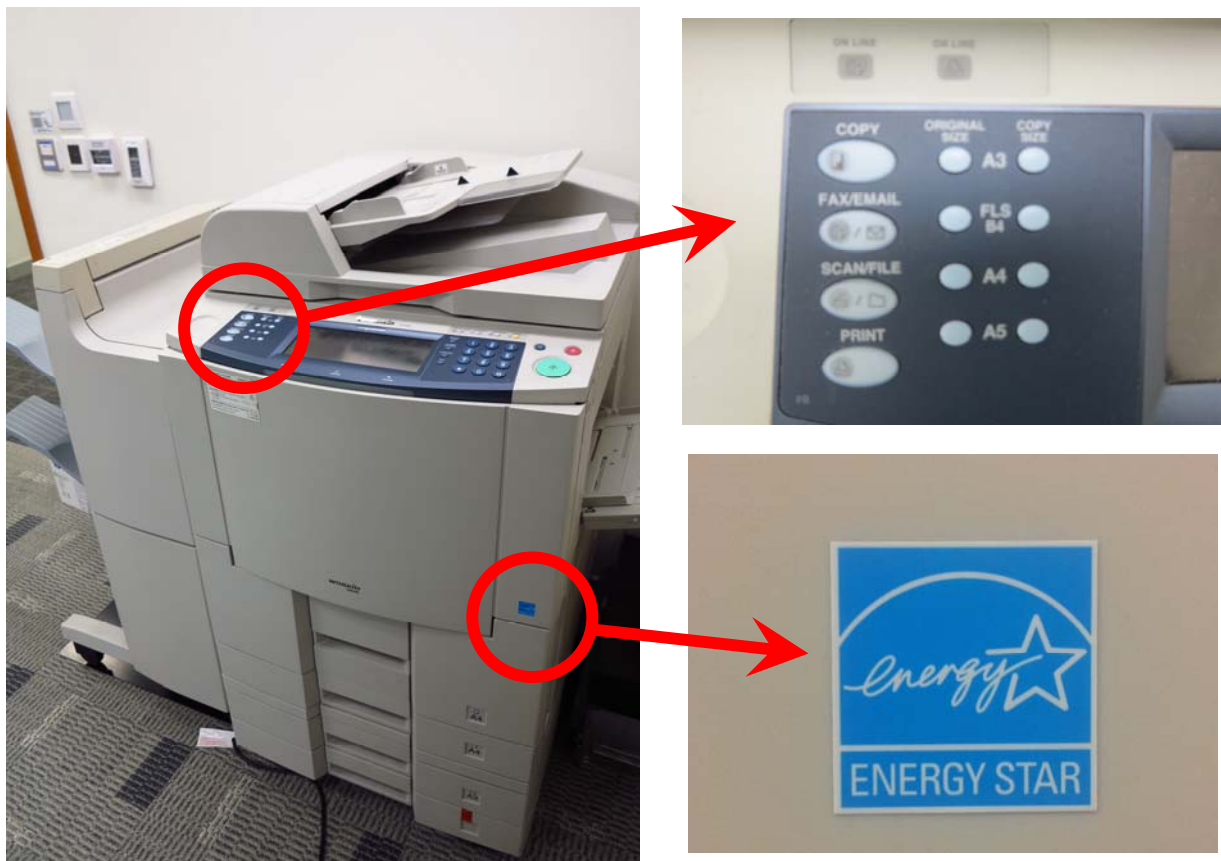
To minimize the aircraft noise disturbance to the local communities, we implement applicable international standards and recommended practices through –

- Developing and implementing aircraft noise mitigating measures
- Monitoring the implementation of noise mitigating measures using an effective aircraft noise and flight track monitoring system
- Keeping in view the latest developments of ICAO standards and recommended practices on aircraft noise
- Reviewing applicable changes for implementation in Hong Kong (e.g. requirements on aircraft noise certification and noise mitigating measures)

## *Green Housekeeping*

To contribute to a greener environment, we implement green housekeeping measures which aim to minimize the consumption of energy, paper and other materials in our daily office operations. Below are some examples of our green housekeeping measures –

- Following the 4Rs Principle: **Reduce**, **Reuse**, **Recycle** and **Replace**
- Encouraging the use of environmental friendly items (e.g. non-single use stationeries and double-sided printers)
- Compliance with environmental regulations
- Enhancing staff participation by placing recycling bins at office
- Strengthening the management of green housekeeping by
  - ✓ Establishing “Environmental Management Committee”
  - ✓ Appointing office green managers



Figures 1-3: Examples of green measures in office

## Chapter 2 – Aircraft Noise Management

CAD is conscious of the aircraft noise impacts on local communities and has developed and implemented a number of noise mitigating measures to reduce aircraft noise disturbance. We adopt a “Review-Plan-Implement-Check” Cycle in aircraft noise management.

We keep reviewing and assessing present aircraft noise impacts and the implemented noise mitigating measures. When planning new aircraft noise mitigating measures, we take into account development of international standards and recommended practices. We consult regularly different stakeholders including affected communities, airlines and airport operators on implementation of noise mitigation measures.

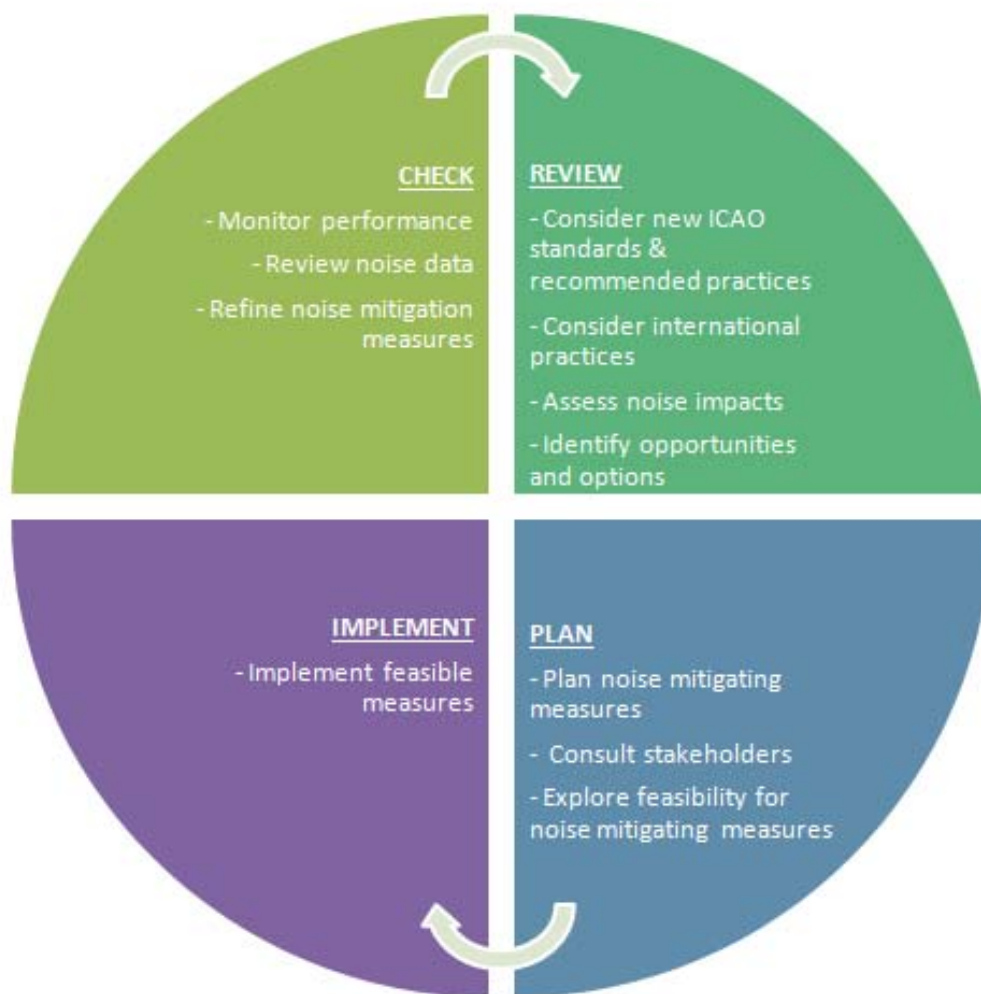


Figure 4: Review-Plan-Implement-Check Cycle

## *Flight paths over water to minimize noise*

To reduce the noise disturbance that overnight aircraft operations may have on local communities, subject to acceptable wind direction and safety considerations, arriving and departing aircraft are required to use the flight paths which are over water for landings at and taking-off from the HKIA.

### **Night Arrivals**

Arrival aircraft between midnight and 7:00 a.m. approaching from the southwest over water could reduce the noise disturbance in populated districts such as Shatin, Tsuen Wan, Kwai Chung, Tsing Yi, Sham Tseng and Tsing Lung Tau.

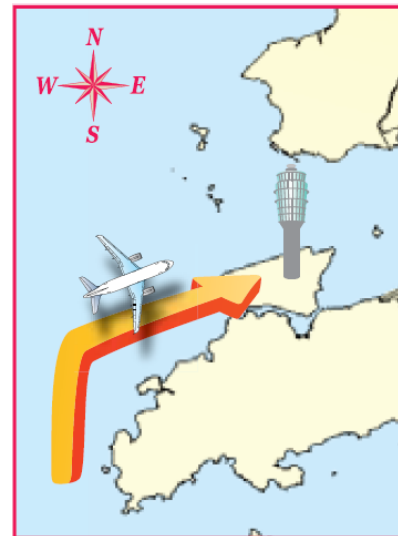


Figure 5

### **Night Departures**

Departure aircraft taking off to the northeast between 11:00 p.m. and 7:00 a.m. depart via the West Lamma Channel could reduce the noise disturbance in populated areas such as Kowloon, North Point, Shau Kei Wan and Chai Wan.

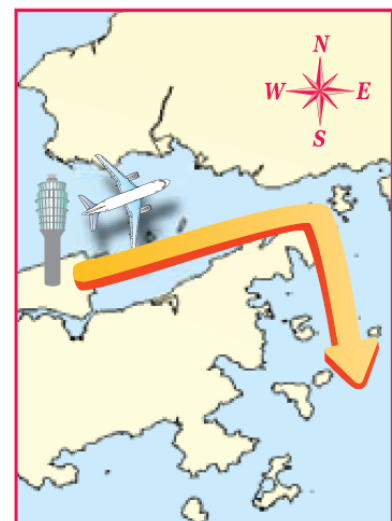


Figure 6

# Noise Abatement Procedures

## Quieter Arrivals

When weather and flight conditions do not allow night arrivals between 11:00 p.m. and 7:00 a.m. to approach from the southwest, arriving aircraft from the northeast direction are encouraged to adopt the Continuous Descent Approach (CDA).

The CDA approach requires the aircraft to fly higher and adopt a lower power and drag configuration during the commencement of the approach, thereby reducing aircraft noise impacts to areas such as Sai Kung, Tseung Kwan O and Ma On Shan.

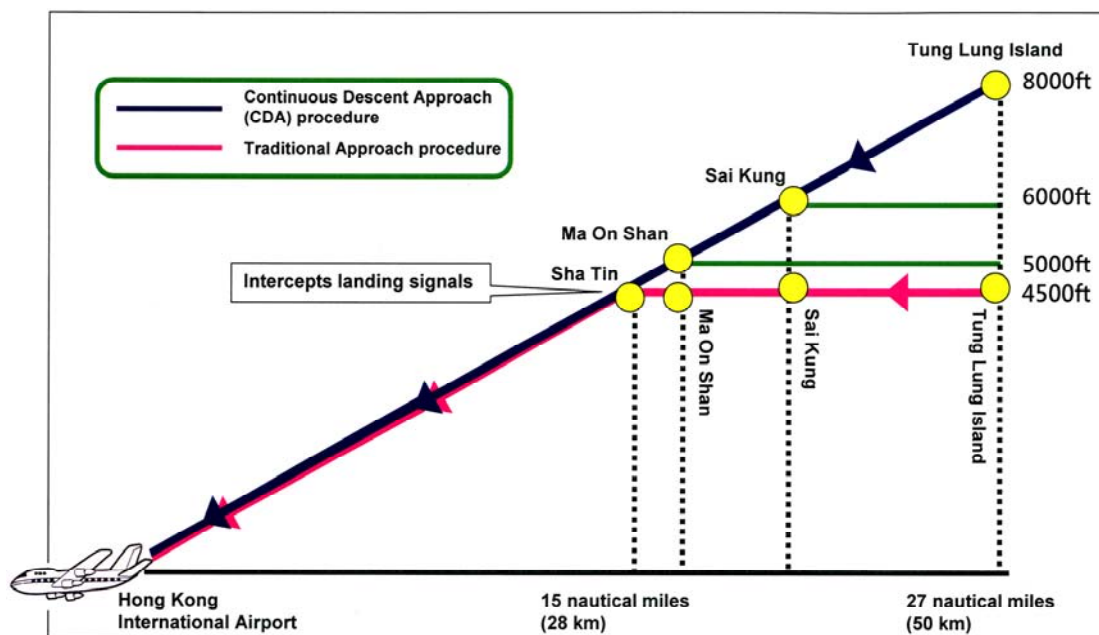


Figure 7: CDA Diagram



## **Quieter Departures**

All aircraft departing to the northeast are required to adopt the Noise Abatement Departure Procedures (NADP) stipulated by ICAO so long as safe flight operations permit.

These procedures require aircraft to initiate noise abatement procedures by means of power reduction upon reaching an altitude of 800 feet or above, thus alleviate aircraft noise impact during take-offs on communities in the vicinity of the airport.

## **Use of Modern Navigation Technology**

CAD has implemented a new noise mitigating departure procedure since 9 February 2012, which involves the use of satellite-based navigation technology. For aircraft departing to the northeast of the airport, the procedure makes use of modern aircraft's on-board navigation capabilities to achieve higher track-keeping accuracy, in particular during the turn around Lantau Island towards the south. The aircraft noise footprint can therefore be confined, reducing the overall aircraft noise effect on residential areas in the vicinity of the flight path.

## ***Banning of noisy aircraft***

Since 1 July 2002, all noisy jet aircraft which do not comply with ICAO Annex 16 Vol. I, Part II, Chapter 3 noise standards are not allowed to operate at Hong Kong. This measure helps to reduce the overall noise impact to the communities in the proximity of flight paths.

## Chapter 3 – Aircraft Emissions

Taking advantage of the latest development in satellite-based navigation technologies, CAD has been able to achieve rationalization of the Hong Kong air route system with a view to enhancing its operating efficiency. The rationalized air routes entail fuel savings and reduction of emissions.

CAD has implemented new air routes with effect from 22 October 2009, which have shorter travelling distances for aircraft arriving from the west and the north of Hong Kong. Each arrival flight from the Mainland, South East Asia and Europe has been able to save up to about 210 kilometres in flight journey or 14 minutes in flight time. During 2012, more than 66,000 flights benefited from these shortened routes and it is estimated that this reduced carbon dioxide (CO<sub>2</sub>) emissions by approximately 406,000 tonnes.

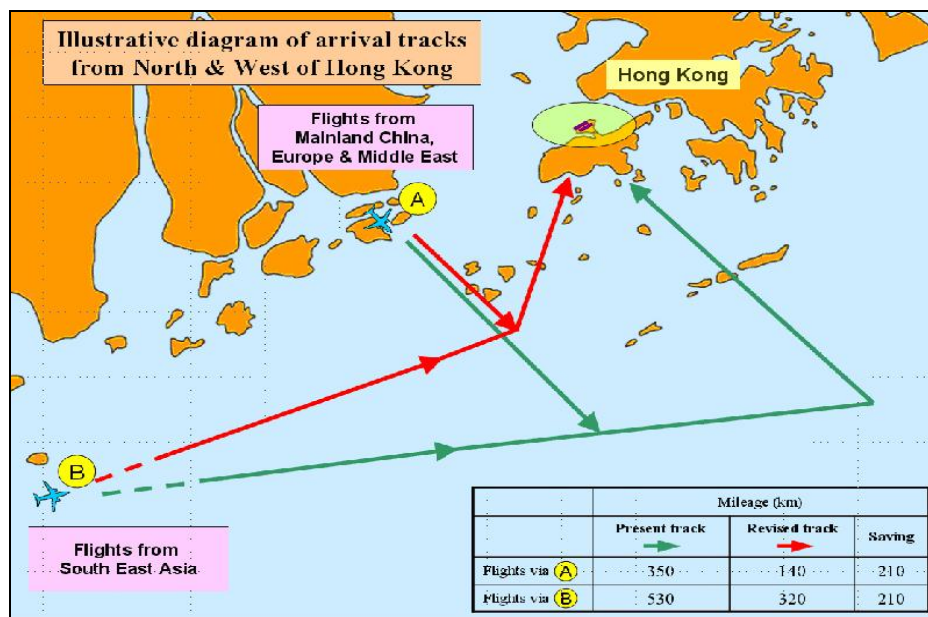


Figure 8: Illustrative diagram of arrival tracks from North & West of Hong Kong

Through collaborative efforts with adjacent air traffic control centres, CAD has implemented reduction of spacing requirement between flights on an air route transiting the Hong Kong and Taipei Flight Information Regions for Korea since July 2011. By reducing spacing requirement between flights, the air route capacity is increased and more aircraft are able to fly at optimum and fuel efficient altitudes, thereby achieving fuel saving and reduction of CO<sub>2</sub> emission. During 2012, around 19,000 flights have used these routes.

# Chapter 4 – Green Housekeeping

We set out different green housekeeping measures in offices to encourage energy conservation, paper conservation, recycling, proper disposal of environmentally hazardous waste and promote environmental awareness among all staff.

## *Energy Conservation*

### **CAD Premises**

We continue to implement green measures and incorporate energy-saving building services features in CAD premises to minimize energy usage. In 2012, energy efficient T5 fluorescent lamps were installed in the Air Traffic Control Complex and Tower (ATCX) and Back-up Air Traffic Control Complex and Tower (BATCX). Two charging points for Electric Vehicles were installed outside ATCX for the department's adoption of Electric Vehicles.

CAD relocated in phases to the new Headquarters at 1 Tung Fai Road, Hong Kong International Airport from 19 November 2012. The CAD Headquarters is constructed with three main design themes, namely “Sustainability”, “Environmental Friendliness” and “Education”. Over 30% of the site area and the roof of the Headquarters is landscaped. Various environmentally friendly and energy-saving facilities such as photovoltaic panels, light pipes, solar lighting collectors with fibre optic solar tracking, solar powered pole lighting and rainwater recycling systems are installed. The CAD Headquarters is one of the “greenest” building premises in Hong Kong.



Figure 9: The New CAD Headquarters

### **Buildings Managed by a Third Party**

For non CAD-owned buildings, we would meet with the respective building managers to discuss the energy saving initiatives if needed. The green measures implemented in such buildings include controlling the temperature of air-conditioning system and limiting the operation hours of chiller plants.

### **Our Performance in 2012**

In 2012, 35,476 kilowatt-hours (kWh) of electricity were consumed by CAD owned-premises on an average day.



Figure 10: Solar Lighting Collectors with Fibre Optic Solar Tracking at the CAD Headquarters

## Paper Conservation

We emphasize the “4R principle” in paper conservation:

### Reduce

- Minimize paper usage by conducting online e-application for flights schedule coordination
- Minimize paper usage by communicating in E-mails and posting circulars on CAD intranet
- Minimize photocopies (e.g., avoid making personal copies)

### Reuse

- Reuse envelopes and loose minutes jackets
- Use blank side of used paper for printing and drafting

### Replace

- Use recycled paper instead of plain paper

### Replace

- Waste paper is collected for recycling

## Our Performance in 2012

In 2012, we used 5,749 reams of paper, which represented a decrease of 17.4% compared with 2011.

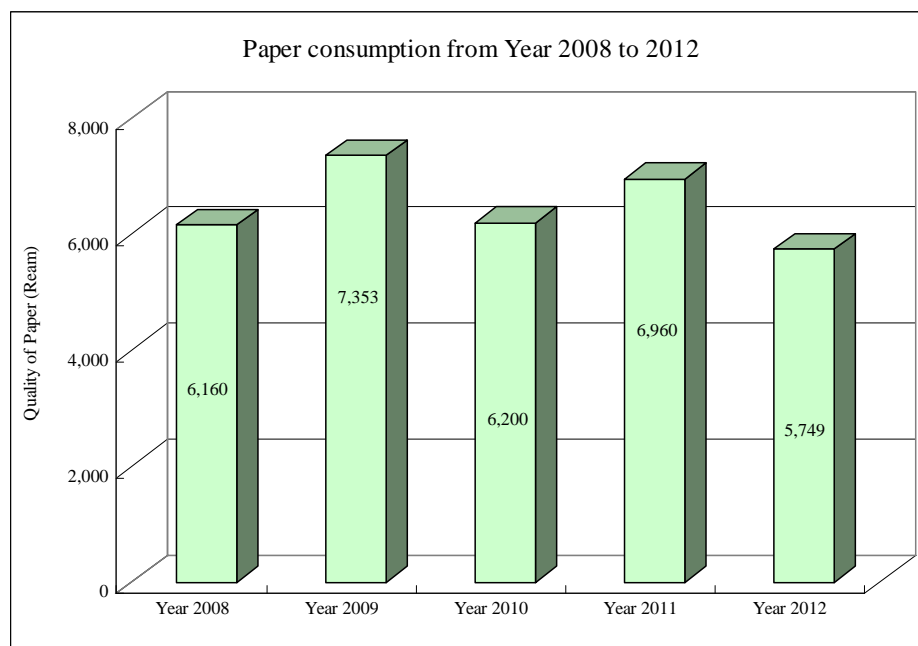


Figure 11: Paper consumption from Year 2008 to 2012

## Recycling

We collect waste paper, used Compact Discs and laser printer cartridges for recycling. Recycling bins are also available in our office to encourage staff participation. The materials collected are forwarded to our suppliers or other designated parties for recycling on a regular basis. The table below shows the comparison of volume of materials sent for recycling in year 2011 and 2012.

### Our Performance in 2012

	Year 2011	Year 2012
Waste Paper Collected (kg)	4,917	4,454
Used Compact Disc Collected (g)	7,027	9,503
Laser Printer Cartridge Collected (units)	892	770



Figure 12: Recycling bins in CAD Headquarters

## Green Procurement

We follow the guidelines advised in the Government's green procurement policy and avoid procuring single-use disposable items. We purchase items that are durable, energy-efficient and recyclable. Below are some examples of green procurement measures implemented in our department:

- Procure equipment such as air traffic control equipment, fluorescent tubes, photocopiers and printers that have obtained an energy label
- Choose green products such as refillable ball pens, mechanical pencils and recyclable laser printer cartridges
- Regularly review of actual need against monthly supply items that have expiry dates
- Avoid using items that are environmental unfriendly, for example, correction fluid and batteries that contain mercury



Figure 13: Example of equipment that has obtained an energy label

## *Proper Disposal of Waste*

### **Chemical Waste**

We operate 13 outstations for the provision of air traffic services. In case the mains electricity supply to these outstations is interrupted, it automatically switches to back-up power supplies (e.g., standby diesel generators or battery packs). However, these alternative power supplies generate chemical wastes which could be hazardous to our environment and thus they have to be disposed in a safe and appropriate way.

### **Our Performance in 2012**

In 2012, our appointed contractor handled all wastes in accordance with the statutory requirements.

### **Sea Water Effluent**

Both ATCX and BATCX use sea water for their cooling systems. To minimize the water pollution problem in Hong Kong, it is necessary to implement controls on waste water discharges to protect public health and the life of aquatic organisms. Under the Water Pollution Control Ordinance, all sea water discharges should be monitored for their flow rate, temperature, pH value and residual chlorine in order to minimize the environmental impacts.

### **Our Performance in 2012**

In 2012, the average daily flow rate and temperature of the sea water effluent discharge from ATCX and BATCX remained well below the prescribed limits. Monthly figures of 2012 are presented in Figures 14 - 17.



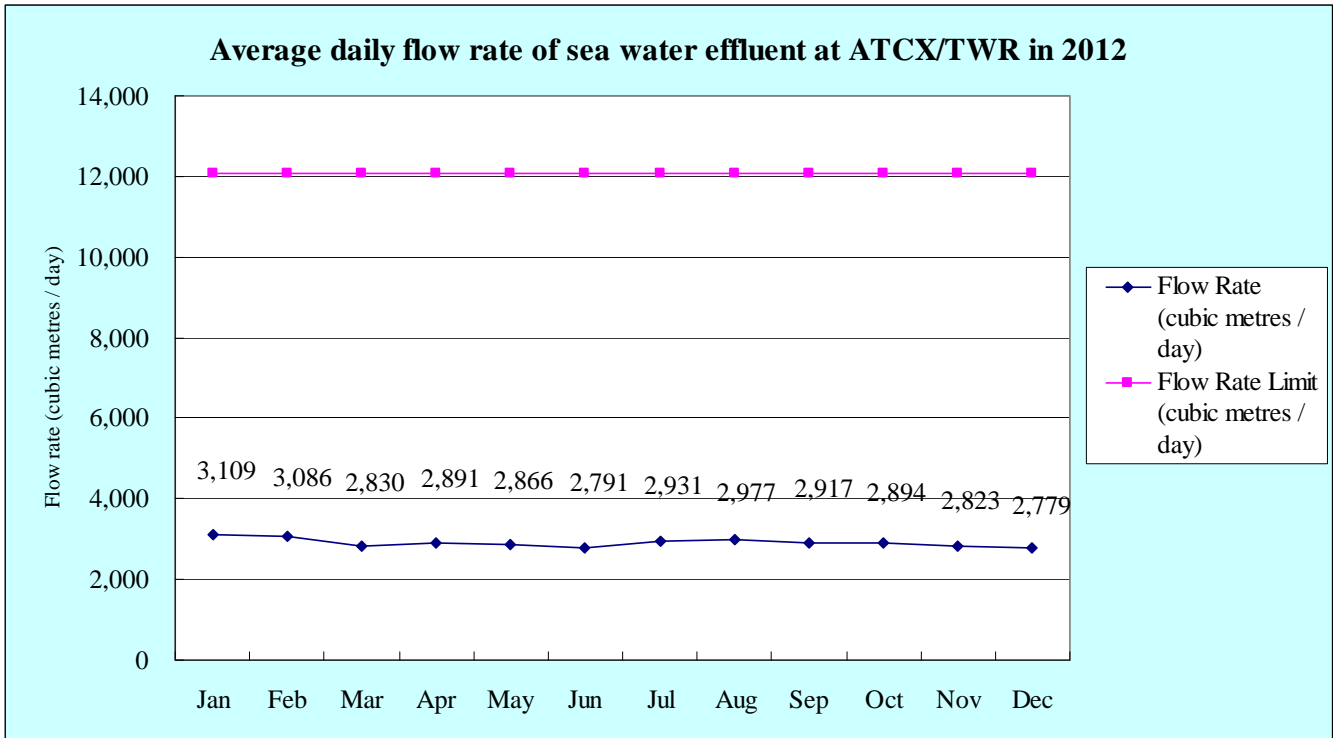


Figure 14: Average daily flow rate of sea water effluent at ATCX/TWR in 2012

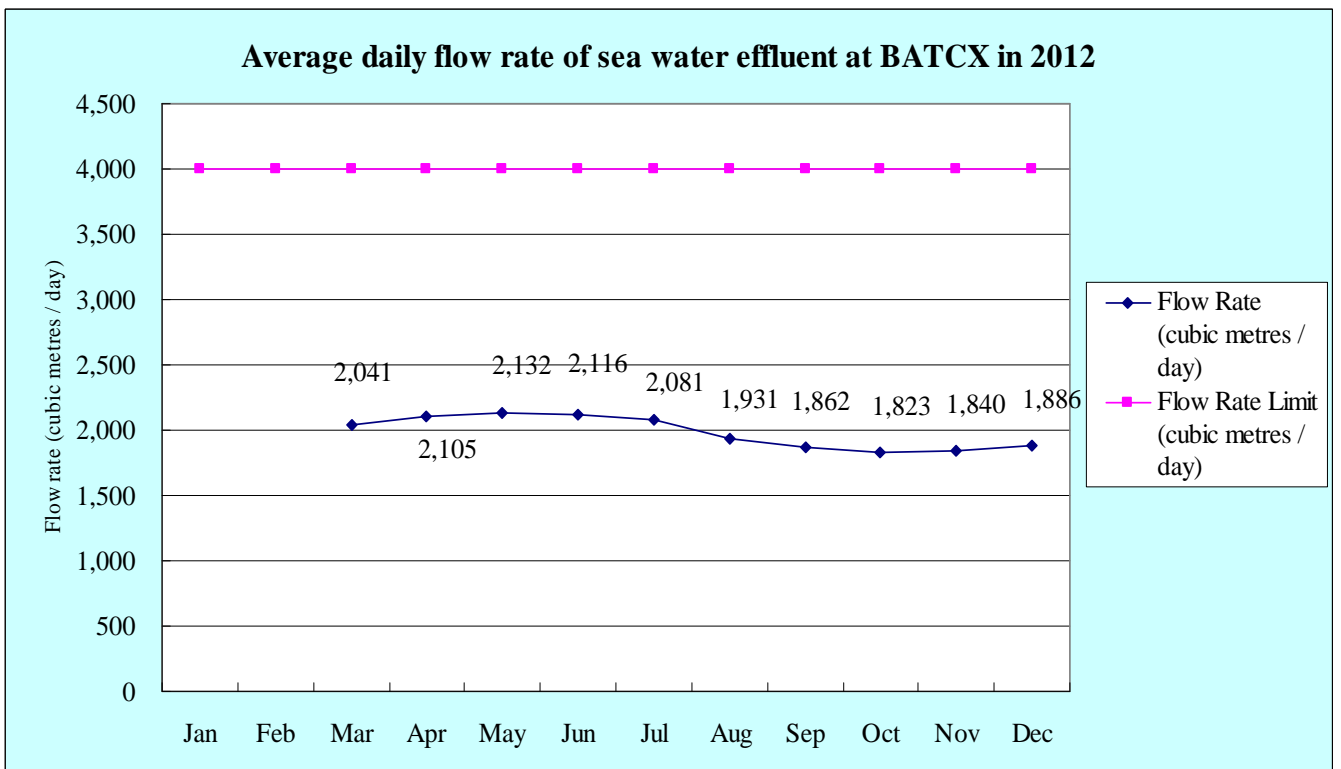


Figure 15: Average daily flow rate of sea water effluent at BATCX in 2012 <sup>2</sup>

<sup>2</sup> The sea water cooling system of the BATCX was not in use in January and February.

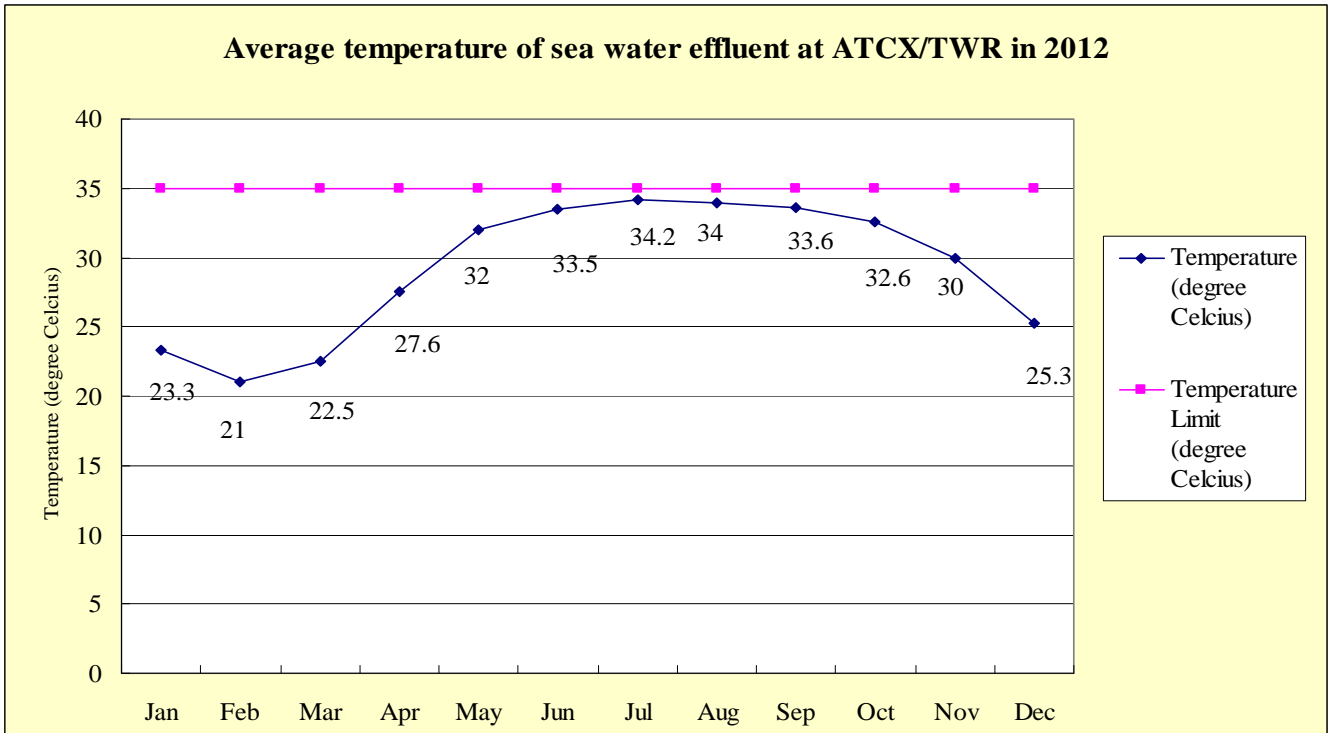


Figure 16: Average temperature of sea water effluent at ATCX/TWR in 2012

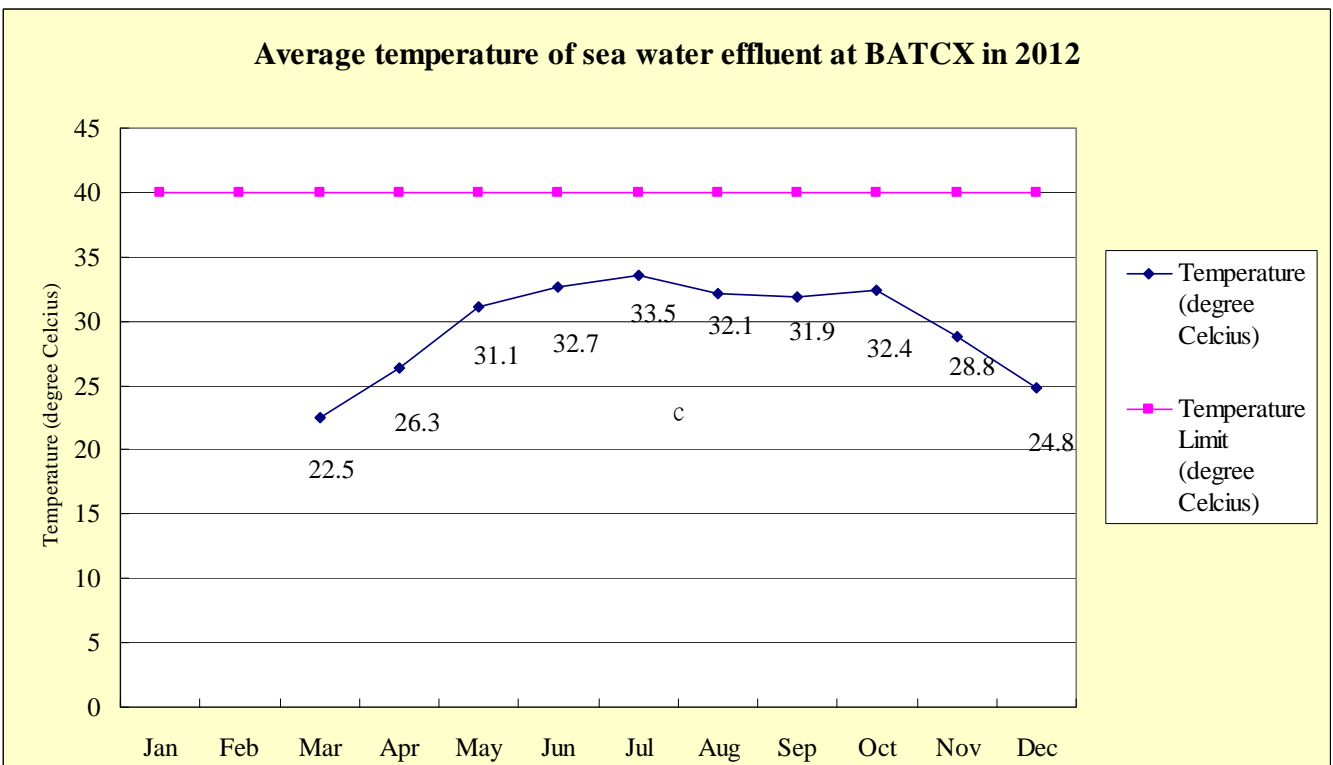


Figure 17: Average temperature of sea water effluent at BATCX in 2012<sup>3</sup>

<sup>3</sup> The sea water cooling system of the BATCX was not in use in January and February.

## Chapter 5 – Performance Summary

### *Our performance in 2012*

- A mass majority of aircraft departing to the northeast flew over water via the West Lamma Channel between 11:00 p.m. and 7:00 a.m.
- All arriving aircraft between midnight and 7:00 a.m. were able to approach from the southwest over water, in the case of acceptable wind direction and safety considerations
- Most of the overnight arrival aircraft from the northeast were able to adopt the Continuous Descent Approach procedure
- We encouraged airlines to adopt the Noise Abatement Departure Procedures for departure aircraft to the northeast
- No older, noisier ICAO “Chapter 2” aircraft operated in Hong Kong
- We implemented rationalized air routes to reduce the environmental footprint of aircraft operations in Hong Kong
- We introduced new noise mitigation procedures using satellite-based navigation technology
- We collected and recycled waste papers, used CDs and laser printer cartridges
- We complied with all environmental regulations regarding the disposal of chemical waste and the discharge of sea water effluent

# Contact Us

We welcome comments and feedback from readers so that we could identify ways for improvements. You can provide your views to us by:

## General Enquiry

Address : Civil Aviation Department Headquarters,  
1 Tung Fai Road,  
Hong Kong International Airport,  
Lantau, Hong Kong

Contact no. : 2910 6342

Fax : 2910 6351

Email : [enquiry@cad.gov.hk](mailto:enquiry@cad.gov.hk)

Website : [www.cad.gov.hk](http://www.cad.gov.hk)

## Aircraft Noise Complaint

Address : (same as above)

Complaint hotline : 2769 6969

Fax : 2326 3654

Email : [aircraftnoise@cad.gov.hk](mailto:aircraftnoise@cad.gov.hk)