

## Flood information for pilots operating to Thailand

The Thai Pilots' Association (ThaiPA) have prepared the following information for pilots scheduled to operate to Thailand while the present flooding and flood risk persists.

### Executive Summary

- ▶ *The present flood emergency started in late July with the flood crest travelling from the north of the country to the south. The flood crest arrived on the southern central region (which includes Bangkok) in late September.*
- ▶ *The flooding and flood potential in the Bangkok area is uncertain since protection depends on temporary flood walls surrounding parts of the city and as well as drainage control systems.*
- ▶ *Suvarnabhumi International (VTBS) is presently operating normally with no flooding in the area around the airport. In addition a flood protection and contingency plan is in place.*
- ▶ *Don Muang Airport (VTBD) is closed due to flooding*

### Background

Thailand is a tropical country, and as such, many areas are at risk to seasonal flash-flooding. Generally speaking the floods will normally begin in the north of the country with monsoon run off flowing into the Chao Phrya river system as well as into the rivers Chi and Mun (tributaries of the Mekong)

These river systems bring large amounts of water southward from the Highlands to the Gulf of Thailand. As a result of the nominal flow rates, various water management schemes have been constructed, these include drainage control, multiple dams, irrigation canals and flood detention basins and, more recently, a system of drainage tunnels which was begun in 2001. However, these measures are inadequate to prevent flooding especially in rural areas, even in normal years.

### 2011 Flooding

This year's major flood event began in late July with the landfall of Tropical Storm Nock-ten in the northern part of Vietnam which led to higher than normal rainfall in the northern and northeastern parts of Thailand. These heavy downpours led to flashfloods in Chiang Mai, Lampang, Lamphun, Mae Hong Son, Nan, Phrae, and Uttaradit in the north, and Bung Kan, Nakhon Phanom, Nong Khai, Sakon Nakhon and Udon Thani in the upper northeast. The upper-central provinces of Phichit, Phitsanulok, Sukhothai were also flooded as the flooding spread down the overflowing Yom and Nan rivers.

This heavier than normal rainfall was further augmented by the effects of the present La Niña event which ensured that the heavy rains continued into August. As result, re-

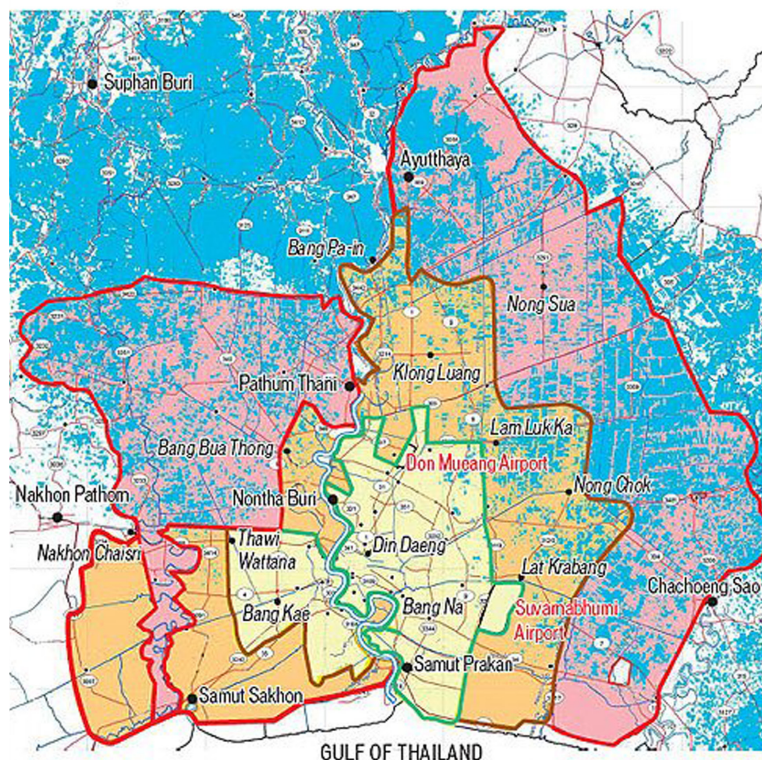
**Flood risk areas in Bangkok, studied by Team Group, a water management consulting firm.**

■ Already flooded

■ Level 3 (highest risk):  
Areas outside flood barriers and along river basins which were hit by major flooding in 1995. Possible flooding is around 1-2 metres

■ Level 2 (high risk):  
Areas inundated in 1995 and which authorities have tried to protect this year by diverting of water and building floodwalls. Possible flooding is around 1-2 metres

■ Level 1:  
Moderate risk areas that did not flood in 1995 but face risk this year. Possible flooding is around 50 cm



cord floods were recorded in Phitsanulok Province, while large areas in the downstream provinces of Nakhon Sawan, Ang Thong, Ayutthaya and Nakhon Nayok were being increasingly affected and the death toll continued to rise to 37 by 22 August. The Bhumibol and Sirikit Dams were increasing discharge rates to compensate for incoming flow.

By 19 September almost all lower central provinces were being affected by flood, i.e. Uthai Thani, Chai Nat, Sing Buri, Ang Thong, Suphan Buri, Ayutthaya, Pathum and, significantly, Thani and Nonthaburi which adjoin Bangkok to the north.

Broken floodgates which allowed water from the Chao Phraya to flow into irrigation canals has resulted in the flooding of large areas of agricultural land in Singburi, Ang Thong and Ayutthaya, but also had the effect of reducing the strain on Bangkok's flood defences.

By the beginning of October the situation for most of the country approached critical, with most of the flood control reservoirs at or near capacity with the result that their usefulness as flood control devices is exhausted.

As of 18 October, The status of the major flood control dams were;

- ▶ Bhumibol Dam: reached 99% capacity.
- ▶ Sirikit Dam: reached 99% capacity.
- ▶ Kwa Noi Dam: reached 100% capacity.
- ▶ Pasak Dam: reached 136% capacity.
- ▶ Ubonrat Dam: reached 120% capacity.
- ▶ Lampao Dam: reached 100% capacity.

Flooding in Ayutthaya worsened as flood water entered the city proper, inundating the Ayutthaya Historical Park and forcing evacuations. Barriers protecting industrial estates failed, resulting in flooding of dozens of major factories and country-wide disruption of manufacturing supply chains. In Nakhon Sawan, the sandbag barrier protecting the city was breached, resulting in rapid flooding of the city. Hundreds of patients had to be transferred out of Ayutthaya and Nakhon Sawan Regional Hospitals by boat as water levels rose over the hospital floors and power supplies and life support systems were disrupted.

In Pathum Thani Province, continuous efforts to reinforce and repair sandbag flood walls were undertaken to prevent the Chao Phraya and Rangsit Canal from overflowing into Bangkok. Several districts in eastern Bangkok which lie outside Bangkok's flood wall, as well as parts of the surrounding Nonthaburi, Pathum Thani, Chachoengsao and Nakhon Pathom Provinces, became flooded as water was diverted from the Chao Phraya to the Nakhon Nayok River and outlying canals. Presently, concern is the possible failure of the flood wall in Pathum Thani. The high tides are expected again between October 27-31, 2011 (expected to be 2.30 – 2.35 m above datum), Naturally this will further increase the risk of further flooding.

## Damage

The flooding has been described as “the worst flooding yet in terms of the amount of water and people affected in 70 years”. As of 15 October, flooding has affected 2,319,218 people, with 297 deaths and 2 missing persons reported by the 24/7 Emergency Operation Center for Flood, Storm and Landslide (EOC, press 1111). Damage estimates of up to 156.7 billion baht (5.1 billion USD) have been made by the University of the Thai Chamber of Commerce. A large part of the damage stems from the affect on the manufacturing industry, with 930 factories in 28 provinces affected, including multiple industrial estates in Ayutthaya and Pathum Thani Provinces which have been flooded. The flooding has been estimated to result in decrease 1 to 1.7 percent in its GDP growth. There are fears that many of the factories currently flooded are unlikely to re-open which could result in significant job losses in the central provinces. This combined with the loss of agricultural jobs due to flooding may spark a rise in crime rates.

## Airport situation

Bangkok's Suvarnabhumi International Airport (VTBS) and other airports are, at present, operating normally. Suvarnabhumi, airport has sought cooperation from the Rural Highways Department to dredge a local canal in order to maximise its drainage capability. To prevent the inner areas of the airport from flooding, the airport has teamed up with the Rural Highways Department to strengthen earthen dykes around the area. In addition, a water-retention reservoir within the airport compound still has 75% of its potential capacity available and can absorb a further 3 million cubic metres of water before its limits are exceeded.

In addition, the airport boasts a three metre high 23.5km earthen floodwall surrounding its perimeter as well as two pumping stations, each capable of pumping one million cubic metres of water per day, and six drainage canals.



VTBS is protected by a three metre high 23.5km earthen floodwall

Cumulatively, these measures are designed to resist up to 149mm of rain in 24 hours (this compares with the highest daily rainfall recorded at the airport since its opening in 2006 which was 105.2mm in October 2009). Furthermore, the airport has in place a contingency plan should the capacity of the normal flood prevention system fail. Airlines, business operators as well as state agencies have been given details of the plan which is ready to put into effect if the situation warrants.

Don Muang Airport (VTBD) which is often filed as the alternate for Suvarnabhumi was closed at 1400 UTC Oct 25 as flood water are covering the runways. The airport will remain closed until further notice. ThaiPA advise that U-Tapao (VTBU) remains available as an alternate at the present time.

Moreover, the major hotels that located on Vibhavadee Rangsit Road (near DMK airport) are considered to be at risk are as follows;

1. Rama Garden
2. Miracle Grand Hotel
3. All Season Vibhavadee
4. Amari Don Muang
5. Mido Hotel
6. Sofitel Centara Grand.

### Surface transport issues

For other transportation systems, there has been some disruption to road and rail transport, particularly on routes north of Bangkok. If you and your crew are in an affected area exercise caution and follow the advice of local authorities. To check areas affected and transport infrastructure impacted please see the regular reports published by the Thai 24/7 Emergency Operations Centre (<http://disaster.go.th/dpm/flood/floodEng.html>).

### Useful Contact Details

#### **Bangkok Metropolitan Administrative (BMA)**

contact +66-2248-5115 or BMA Hotline 1555

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