AEROTHAI

Air Traffic Management
Network Management Centre

Towards Global ATFM
Delivering ATM Ops Performance via Regional Network Collaboration

18 September 2014
Beijing, China

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Thailand: Traffic Growth

Actual traffic on Air Situation Display

14% p.a. since 2010

2013 Forecast

Historical Forecast

Annual Movements (Fiscal Year)

- International
- Domestic
- Overflight
- Others

Total

2008 461,619
2009 417,607
2010 452,286
2011 521,780
2012 576,463
2013 669,022
2014 770,593
2015 920,101
2016 1,008,410
2017 1,106,982
2018 1,205,643
2019 1,293,890
2020 1,391,574
2021 1,488,266
2022 1,584,957
2023 1,681,648

18 Sep 2014
Traffic Growth by Direction

**North**
120,608 Flights/Year
330 Flights Daily
Overall GR: **22.5%**

<table>
<thead>
<tr>
<th>Volume</th>
<th>GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int’l</td>
<td>56%</td>
</tr>
<tr>
<td>Dom</td>
<td>39%</td>
</tr>
<tr>
<td>Overfly</td>
<td>5%</td>
</tr>
</tbody>
</table>

**East/North East**
164,025 Flights/Year
449 Flights Daily
Overall GR: **11.8%**

<table>
<thead>
<tr>
<th>Volume</th>
<th>GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int’l</td>
<td>69%</td>
</tr>
<tr>
<td>Dom</td>
<td>19%</td>
</tr>
<tr>
<td>Overfly</td>
<td>12%</td>
</tr>
</tbody>
</table>

**West**
111,066 Flights/Year
304 Flights Daily
Overall GR: **9.9%**

<table>
<thead>
<tr>
<th>Volume</th>
<th>GR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int’l</td>
<td>71%</td>
</tr>
<tr>
<td>Dom</td>
<td>0%</td>
</tr>
<tr>
<td>Overfly</td>
<td>29%</td>
</tr>
</tbody>
</table>

**South**
222,317 Flights/Year
609 Flights Daily
Overall GR: **15.5%**

<table>
<thead>
<tr>
<th>Volume</th>
<th>GR</th>
</tr>
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<tbody>
<tr>
<td>Int’l</td>
<td>37%</td>
</tr>
<tr>
<td>Dom</td>
<td>53%</td>
</tr>
<tr>
<td>Overfly</td>
<td>10%</td>
</tr>
</tbody>
</table>

Volume GR

- Int’l: 56% 24.9%
- Dom: 39% 18.9%
- Overfly: 5% 24.8%

Note: Annual Growth Rate / Data up to 30 Jun 2014
Supporting Traffic Increase: Infrastructure

Thailand Modernization CNS/ATM System

Thailand Modernization CNS/ATM System Project

Volume-II: Technical Terms of Reference

November, 2012
AERONAUTICAL RADIO OF THAILAND
BANGKOK, THAILAND

18 Sep 2014
AEROTHAI ATM NMC
1. "Air Traffic Management Centre
   - Nationwide ATC System Upgrade
   - Combined Bangkok ACC – Provincial Approach Control Centre
   - Air Traffic Management Network Management Centre

2. "CNS Infrastructure Upgrade
   - Surveillance Upgrade
   - Communications Upgrade
   - Contingency Facilities
### Airport Capacity: Selected Major Airports

<table>
<thead>
<tr>
<th>Airport</th>
<th>Capacity (Hourly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiang Mai (VTCC / CNX)</td>
<td>24</td>
</tr>
<tr>
<td>Don Mueang (VTBD / DMK)</td>
<td>40</td>
</tr>
<tr>
<td>Suvarnabhumi (VTBS / BKK)</td>
<td>68</td>
</tr>
<tr>
<td>Phuket (VTSP / HKT)</td>
<td>20</td>
</tr>
</tbody>
</table>
Demand-Capacity Balance: 2015-2016

Peak Hour Traffic vs Capacity (Sector Entry Count)
2015
Assuming no capacity enhancement

Peak Hour Traffic vs Capacity (Sector Entry Count)
2016
Assuming no capacity enhancement
Addressing Traffic Growth

• Capacity Enhancement before new ATC System
  – ATC Workload reduction initiatives
    • “Manual” Departure Management
    • Arrival Management enhancements
  – Route Structure enhancements
  – New SID/STAR for Bangkok TMA

• CDM/ATFM Operations

• Initiatives after new ATC System
Addressing Traffic Growth

- Capacity Enhancement before new ATC System
- CDM/ATFM Operations
  - “Semi-Manual” ATFM for Bangkok ACC Sector 1
  - ACC Sector Capacity Review
  - Establish ATM Network Management Centre (ATM NMC)
  - Distributed Multi-Nodal CDM/ATFM Network (ATFM Operational Trial Project)
  - ATFM/CDM Automation Support
  - Support transition to new ATC System
- Initiatives after new ATC System
ATM Network Management Centre (ATM NMC)
ATM Network Management Centre (ATM NMC)
- **ATFMU Manager/Planner**
  - Plan and coordinate capacity adjustment for next day’s operation
  - Plan and coordinate ATFM Daily Plan for the next day’s operation
  - Manage proper execution of ATFM Measures on day of operation based on ATFM Daily Plan

- **ATFMU Executive**
  - Coordinate tactical capacity adjustment on ATM resources
  - Monitor and execute ATFM Measure on day of operation as required based on ATFM Daily Plan

- **ATFMU Officer**
  - Ensure proper integration of traffic demand inputs
  - Ensure proper configuration of ATFM automation support systems
Current Special Use Airspace in Thailand

PROHIBITED, RESTRICTED AND DANGER AREAS

BANGKOK FIR = 777,760 km²

Prohibited + Restricted + Danger Areas = 384,459 km²
= 49.4 % of BANGKOK FIR
Current Flexible Use of Airspace in Thailand

Parallel Routes through SUA

Special Use Airspace

International Routes through SUA

Y5 (Phuket - Bangkok) available when SUA inactive

Y6 & Y7 (Bangkok – Chiang Mai)
Availability: H24
Southern Conditional Routes (Jun 2014)

Y8-Y12 established with effect from 26 June 2014

Y9-Y10 being extended into Malaysia’s Kuala Lumpur FIR

Y11-Y12 harmonization being discussed with Malaysia and Singapore
Addressing Traffic Growth

• Capacity Enhancement before new ATC System
• CDM/ATFM Operations
• Initiatives after new ATC System
  – AIDC Automated Aircraft Handoff with neighboring FIRs
  – Automatic aircraft coordination within Bangkok FIR
  – SSR Mode S and ADS-B Equipage requirement (TBD)
  – More “flexible” sector configurations
    • Potential for more upper airspace sectors
  – Further enhanced cross-border ATFM collaboration in accordance to Network Operations principle