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Changing Traffic, Changing Communication Dynamics: Training for The Next Generation of Pilots and Controllers in Asia

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Changing Traffic, Changing Communication Dynamics
Training for The Next Generation of Pilots and Controllers in Asia

Michael Kay
ICA EA President

INTERNATIONAL CIVIL AVIATION ENGLISH ASSOCIATION
supporting the use of English for aviation safety
Elements in air-ground communication

- Safe operations
- Effective actions
- The means for sharing information
- The tool for communication
- Meaning to language
- Operational knowledge
- Content for communication
- Operational context
IATA latest forecast: demand for air travel could double to 8.2 billion passengers in 2037

Fastest growing region: 5.3% growth in traffic per annum

Revenue Passenger Kilometres (trillions)
Regional growth in traffic: 2018 to 2037

Share of world traffic by 2037
- China: 17%
- South East Asia: 9%
- South Asia: 6%
- Oceania: 2%

Regional growth in traffic: 2018 to 2037
- Asia-Pacific
- Europe
- North America
- Latin America
- Middle East
- Africa

RPK (Trillions)
## Changing top markets: Asia-Pacific growth

<table>
<thead>
<tr>
<th>2017</th>
<th>2037</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. US</td>
<td>1. China</td>
</tr>
<tr>
<td>2. China</td>
<td>2. US</td>
</tr>
<tr>
<td>3. UK</td>
<td>3. India</td>
</tr>
<tr>
<td>4. Spain</td>
<td>4. Indonesia</td>
</tr>
<tr>
<td>5. Japan</td>
<td>5. UK</td>
</tr>
<tr>
<td>6. Germany</td>
<td>6. Spain</td>
</tr>
<tr>
<td>7. India</td>
<td>7. Japan</td>
</tr>
<tr>
<td>8. Italy</td>
<td>8. Germany</td>
</tr>
<tr>
<td>10. Indonesia</td>
<td>10. France</td>
</tr>
</tbody>
</table>
World passenger aircraft fleet forecasts by region: 2037
New pilots needed by 2037

- 35% of world’s new 637,000 pilots needed in Asia-Pacific
- 35% of 637,000 = 225,450
- 117,000 pilots in Asia-Pacific
- 106,000 pilots in Europe
- 63,000 pilots in Latin America
- 22,000 pilots in North America
- 117,000 pilots in Africa
- 117,000 pilots in Middle East
- 253,000 pilots in CIS

35% of 637,000 pilots needed in Asia-Pacific.
Asia-Pacific: Greatest demand for new pilots

Boeing says Asia needs 240,000 pilots over next two decades

By Leilah Santorelli
BBC Business reporter

28 August 2018
Asia-Pacific: New pilots needed by 2037

Number of pilots flying in Asia-Pacific airspace

270% increase in number of pilots flying in Asia-Pacific airspace

240,000 additional NEW pilots flying in Asia-Pacific airspace
Training needs for the next generation of pilots and ATCOs

More NNES pilots and ATCOs joining the industry

→ Increasing demand for language training and for improving language proficiency
How will this extra traffic affect operations?

- More congestion
- More holding
- New airways
- More airports
- Busier operations
- More personnel
- More communication
More traffic means less available radio talk time
Need for more efficient communication
Training needs for the next generation of pilots and ATCOs

More traffic, congestion → less radio talk time

→ Language and communication training for efficient air-ground communications (say and understand messages accurately, confirm and clarify efficiently with limited talk time)
Where will all these extra personnel come from?

*While contract pilots can be effective in addressing part of the demand, airlines are creating their own dedicated cadet programs to source local pilots for the long term (CAE, 2017).*

More NNES personnel means shift in speaker language backgrounds on the radio
Snapshot of traffic in Bangkok FIR
April 26, 2019

- 103 Overflying NES
- 190 Overflying NNES
- 485 Intl. NES
- 900 Intl. NNES
- 1230 NNES domestic
- 35% of Intl. and overlying pilots are NES
- All domestic NNES

Flight statistic per day

2,929
Bangkok FIR
As of 26/04/2019
during 00:00-23:59 UTC
8% growth in Thai FIR in 2018
12% growth in international flights
7% growth in overflying flights
5% growth in domestic flights
3-4% in NES regions
10% NES work in on Asian carriers
LCC NNES pilot traffic high growth
China and SE Asia high growth

10 Year daily projection of numbers of pilots and language backgrounds flying within the Bangkok FIR
Intl. NNES : Intl. NES – 20 year forecast
How will this shift in the proportion of NNES speaking pilots affect communications?
Communication interface: NES⇌NES

Language use & proficiency

Communicative competence

Cross-cultural communicative competence
Communication interface: NNES ↔ NNES
Training needs for the next generation of pilots and ATCOs

Greater proportion of NNES operating
Shift in communication dynamics

→ Communicative competence for effective cross-cultural communication:
  • recognise and repair communication breakdowns
  • be comfortable in asking for clarification
  • adapt language for others
  • recognise implied meaning
  • be concise and timely
Snapshot of worldwide pilot ages (2016)

- Average pilot age today is 45 years
- Mandatory retirement age 60-65

- <35 years: 20%
- 35-49 years: 35%
- > 50 years: 45%
Information engagement skills

Seeking and sharing information

- Asking for information (ATC/PILOT)
- Providing options (ATC)
- Explaining/describing (ATC/PILOT)
- Justifying/giving reasons (ATC/PILOT)

Operational experience
Shift in proportion of pilots with operational experience: 10 years

- 2019: 80% over 35 years
- 2029: 40% over 35 years
- 2019: <35 years
- 2029: 35-65 years

Shift in proportion of pilots with operational experience: 10 years
How will the shift in ratio of experienced to less experienced personnel affect communications?

- More crowded airspace, less talk time available, more NNES with less operational experience
- Preference for minimal communication (cultural)
Operational knowledge affects efficiency in communication
**Operational knowledge affects efficiency of communication**

<table>
<thead>
<tr>
<th>Role</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIC101</td>
<td>Uh, the problem we are facing is the ceiling. We can’t continue with the ILS with a ceiling of just 200, because every time we try to lock onto the localizer, it’s just gone.</td>
</tr>
<tr>
<td>APP</td>
<td>Ok, so you cannot do an auto-land?</td>
</tr>
<tr>
<td>AIC101</td>
<td>No auto-land is not available. We’re on one radio altimeter. We’ve got multiple instrument failures.</td>
</tr>
<tr>
<td>APP</td>
<td>So what ceiling do you need?</td>
</tr>
<tr>
<td>AIC101</td>
<td>Ah, we need something where we can do a non-precision approach. Anything above 600 or so.</td>
</tr>
<tr>
<td>APP</td>
<td>Ok I got it. Ok, I understand now.</td>
</tr>
<tr>
<td>APP</td>
<td>And, ah I’m showing Newark at 400 feet, overcast.</td>
</tr>
<tr>
<td>AIC101</td>
<td>Approach, Air India 101, can we go to Newark? We’ll try there.</td>
</tr>
<tr>
<td>APP</td>
<td>Ok, so you want to do the VNAV approach into Newark, is that correct?</td>
</tr>
<tr>
<td>AIC101</td>
<td>That’s correct. And, if I have a better ceiling once I go visual, I’ll continue with the approach.</td>
</tr>
</tbody>
</table>
Language training: link to operational skills and knowledge

- **Information engagement skills**
  - Offering and offering information (often operational)
  - Transferring *necessary* information
  - Using shared operational knowledge to facilitate effective communication

Background operational knowledge facilitates effective and efficient communication
Training needs for the next generation of pilots and ATCOs

Greater proportion of less-experienced NNES personnel - younger workforce

→ Acquire operational knowledge to facilitate information sharing for effective and efficient communication
Preparing the next generation of pilot and ATCOs

- Acquire operational knowledge
- Develop language proficiency
- Develop communication skills

Operational context

Content for communication

Operational knowledge

Meaning to language

The tool for communication

The means for sharing information

Effective actions

Safe operations
Risk scenario: “perfect storm”

- NNES
- ICAO Level 4 (?)
- Inadequate language & communications training
- Insufficient proficiency
- Low communicative competence
- Insufficient operational experience

Ineffective and inefficient communication → Time wasted

- High traffic volume
- Multiple pilots competing for frequency
- Bad weather (traffic holding)
- Problem onboard
- Pilot unable to effectively communicate problem and intentions
- ATCO unable to understand, clarify or repair communication breakdown

- NNES
- ICAO Level 4 (?)
- Inadequate language & communications training
- Insufficient proficiency
- Low communicative competence
- Inadequate operational experience
Training needs for the next generation of pilots and ATCOs

1. More NNES pilots and ATCOs joining the industry
   → Increasing demand for language training and for improving language proficiency

2. Growth in Asia-Pacific → more pilots (and ATCOs)
   More traffic, congestion → less radio talk time
   → Communication training for efficient air-ground communications

3. Greater proportion of NNES operating
   Shift in communication dynamics
   → Communicative competence for effective cross-cultural communication (recognise and repair communication breakdowns)

4. Greater proportion of less-experienced NNES personnel - younger workforce
   → Acquire operational knowledge to facilitate information sharing for effective and efficient air-ground communication
Increasing need for proficiency in air-ground communication
Preparing the next generation of pilot and ATCOs

- Acquire operational knowledge
- Develop language proficiency
- Develop communication skills

- Is there a sequence to these in training?
- How can they each be integrated into training?
- Do we need to look at new approaches as demand increases?