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

Michael Kay
President, ICAEA

Follow this and additional works at: https://commons.erau.edu/icaea-workshop

Scholarly Commons Citation
https://commons.erau.edu/icaea-workshop/2019/day-1/2

This Presentation is brought to you for free and open access by the Conferences at Scholarly Commons. It has been accepted for inclusion in International Civil Aviation English Association by an authorized administrator of Scholarly Commons. For more information, please contact commons@erau.edu.
Changing Traffic, Changing Communication Dynamics
Training for The Next Generation of Pilots and Controllers in Asia

Michael Kay
ICAEA President
Elements in air-ground communication

- operational context
- content for communication
- operational knowledge
- meaning to language
- the tool for communication
- the means for sharing information
- effective actions
- safe operations
- effective actions
- the means for sharing information
- meaning to language
- operational knowledge
- content for communication
- operational context

operational context
content for communication
operational knowledge
meaning to language
the tool for communication
the means for sharing information
effective actions
safe operations
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.
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:
- Asia-Pacific: 2018 (x), 2037 (x)
- Europe: 2018 (x), 2037 (x)
- North America: 2018 (x), 2037 (x)
- Latin America: 2018 (x), 2037 (x)
- Middle East: 2018 (x), 2037 (x)
- Africa: 2018 (x), 2037 (x)

[Bar chart showing traffic growth by region]
## 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

North America: 117,000
Latin America: 106,000
Europe: 63,000
Africa: 22,000
Middle East: 117,000
CIS: 52,000
Asia-Pacific: 253,000

35% of world’s new 637,000 pilots needed in Asia-Pacific
Asia-Pacific: Greatest demand for new pilots
Asia-Pacific: New pilots needed by 2037

240,000 additional NEW pilots flying in Asia-Pacific airspace

270% increase in number of 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

- 35% of Intl. and overlying pilots are NES
- All domestic NNES

2,929 aircraft

- 103 Overflying NES
- 190 Overflying NNES
- 485 Intl. NES
- 900 Intl. NNES
- 1,230 NNES domestic

Flight statistic per day

As of 26/04/2019
during 00:00-23:59 UTC
10 Year daily projection of numbers of pilots and language backgrounds flying within the Bangkok FIR

- 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
Intl. NNES : Intl. NES – 20 year forecast

- 35% NES
- 10% NES

2019 2024 2029 2034 2039
How will this shift in the proportion of NNES speaking pilots affect communications?
Language use & proficiency

Communicative competence

Cross-cultural communicative competence

Communication interface: NES <-> NES
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
• Average pilot age today is 45 years
• Mandatory retirement age 60-65

Snapshot of worldwide pilot ages (2016)
Communication skills: sharing information

- **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

- 80% over 35 years
- 40% over 35 years
- <35 years
- 35-65 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
AIC101 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.

APP Ok, so you cannot do an auto-land?

AIC101 No auto-land is not available. We’re on one radio altimeter. We’ve got multiple instrument failures.

APP So what ceiling do you need?

AIC101 Ah, we need something where we can do a non-precision approach. Anything above 600 or so.

APP Ok I got it. Ok, I understand now.

APP And, ah I’m showing Newark at 400 feet, overcast.

AIC101 Approach, Air India 101, can we go to Newark? We’ll try there.

APP Ok, so you want to do the VNAV approach into Newark, is that correct?

AIC101 That’s correct. And, if I have a better ceiling once I go visual, I’ll continue with the approach.
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
Risk scenario: “perfect storm”

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

Ineffective and inefficient communication → Time wasted

- Bad weather (traffic holding)
- High traffic volume
- Multiple pilots competing for frequency
- 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
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

- 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?

- Acquire operational knowledge
- Develop language proficiency
- Develop communication skills
ICA O LPR testing systems

Language training programmes

Pilot and ATCO language proficiency

Available radio talk time

Pilot and ATCO communicative competence

Operational knowledge for effective

and efficient communication

ICA OEA