Fatigue Management

Shaping Asia Pacific ATM - Global Vision, Regional Action

4 - 6 MAY 2016
QUEENSTOWN, NEW ZEALAND

CANSO ASIA PACIFIC CONFERENCE
Discuss at your table

Who is accountable for the management of fatigue?
Obligations

REGULATORS
Provide a regulatory framework that:
• Enables adequate fatigue management
• Ensures that the ANSP is managing their fatigue related risks

SERVICE PROVIDERS
• Implement work schedules that enable Air Traffic Controllers to perform their duties safely
• Provide a working environment that has appropriate emphasis on controls and/or mitigations for fatigue-related risk
• Provide adequate opportunities for rest and sleep
• Provide fatigue management education and awareness training for all stakeholders
• Have a process for monitoring and managing fatigue

AIR TRAFFIC CONTROLLERS
• Arrive for work fit for duty
• Make appropriate use of non-controlling periods (both between duty periods and during a duty period)
• Manage own fatigue levels
• Report fatigue issues
How do mature ANSPs manage fatigue?

- FAA
- NATS
- Airways
- Airservices
Defining Human Performance

Human Performance is about using scientific human factors knowledge directly and consultatively to support and contribute to the needs of the ATO and its users.

Level of effectiveness achieved by ATO employees in their work

Influences that underlie the work of ATO employees and the discipline that optimizes these influences
Human Performance Process Areas

1. ATO Human Performance Strategic Activities
2. External Human Performance Leadership
3. ATO Operations Optimization
4. Operational Human Performance Education & Training
ATO HP Program Elements

Human Factors

Health & Wellness

Fatigue Risk Management

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ATO Fatigue Risk Management

• Four components of FRM

- Fatigue Policy and Documentation
- Fatigue Risk Management
- Fatigue Safety Assurance
- Fatigue Safety Promotion
FRM Policy and Documentation

• Policy - FAA Order JO 1030.7A establishes:
  – ATO FRM Team
    • Dedicated resources to collaboratively conduct FRM
    • ATO FRM System
  – Collaborative ATO Fatigue Safety Steering Committee
    • Senior level collaborative steering committee
      – FAA management, NATCA, PASS
    • Meets monthly
      – Quarterly two day in person meetings
      – Monthly teleconferences
      – Planned and facilitated by FRM Team
Fatigue Risk Management

1. Ongoing data collection
   A. VSRP
      • ATSAP - fatigue related questions (2011)
      • TSAP – fatigue related questions (under development)
   B. Fatigue baseline studies
      • Controller Alertness and Fatigue Monitoring Study (2012)
      • Technical Operations Fatigue Baseline Study (2013)
      • Alaska Flight Service Station Fatigue Assessment (2013)
   C. ATO operational event data
ATO Approach to FRM

2. Analyze data / assess safety risk:
   - Facilitated by ATO FRM Team
   - Conducted by collaborative FRM workgroups
   - Supported by fatigue science and data
     • In house fatigue scientist
     • Utilize SAFTE-FAST fatigue modeling software
   - Exploring innovative methods to define what constitutes a fatigue-related safety hazard
ATO Approach to FRM

3. Recommend fatigue controls / mitigations
   - A55 FRM WG recommendations (2011)
     ➢ Resulted in FAA/NATCA Fatigue MOUs
   - TO FRM WG recommendations (2012)
     ➢ Resulted in FAA/PASS Fatigue MOUs
   - ATO FSSC FRM Work group (2014)
     ➢ Resulted in changes to ATO JO 7210.3
       ➢ 2-6-13 Single Person Midnight Operations
       ➢ 2-6-7 Basic Watch Schedule
Fatigue Safety Promotion

- FAC Training for ATC and Tech Ops (2013⇒)
  - CAMI Analysis ~24% increase in FAC knowledge
- Targeted FRM Bulletins on specific issues
  - Began in 2013, 11 published to date
- Partnership for Safety
  - FRM content to local safety councils
- ATO Fully Charged campaign
  - Began in 2014, videos, articles
- ATO Fully Charged App
  - User support app to inform on sleep, sleep disorders, chronotype, fatigue assessment and countermeasures (under development)
Fully Charged

Insert Fully Charged Intro Video
Fatigue Safety Assurance

• Gather and analyze compliance data:
  1. Compliance with prescriptive schedule rules
     • Review of actual schedules worked
  2. Effectiveness of prescriptive rules at improving alertness of operational staff
     • Have established fatigue baseline data for ATC and Technical Operations (2011 and 2012)
     • Planning sampling analysis to determine effectiveness if existing controls and mitigations
NATS

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Prescriptive Limitations

The UK has a Scheme for the Regulation of Air Traffic Controllers Hours (SRATCOH) published by the UK CAA as CAP 670
- The prescriptive limitations can found in Part D, Section 2

It’s purpose is to:
• “ensure, as far as is reasonably possible, that controller fatigue does not endanger aircraft and thereby to assist controllers to provide a safe and efficient service”
SRATCOH Prescriptive Limitations

- Periods of duty
- Intervals between periods of duty
- Consecutive periods of duty
- Operational duty

- Night duty
- On call duty
- Early starts
- Morning duty
- Holidays
Local Agreements

- SRATCOH provides generic, maximum limitations

- Each part of our operation also has local agreements which are equal to or more restrictive than SRATCOH
  - These take into account what a controller in that part of the operation actually does
Actual Practice

• Supervisors make on-going tactical decisions based on current and predicted controller workload and who they have available.

  – How many sectors need to be open?
  – How busy is an individual controller?
Example for a Busy London Sector

• SRATCOH
  • “No operational duty shall exceed a period of two hours”

• Local Agreement
  • No operational duty shall exceed a period of 90 minutes

• Actual Practice
  • At busy times, controllers work for around 60 minutes
Fatigue Reporting in NATS

- NATS has a good safety reporting culture
- Over the last 5 years, there have been no safety incident reports where fatigue has been identified as a causal factor
- Does that confirm that we are managing fatigue effectively?
- Should we be worried?
Awareness training was provided and workshops were held with controllers to highlight:

- The signs of fatigue in themselves and their colleagues
- Tips and techniques for avoiding / managing fatigue
- What to do if fatigue is identified

Stories and anecdotes were shared

- “I’ve never been fatigued at work but I have a friend who ...”
Measuring Fatigue

Method used

• Electronic data collection via touchscreens

• Subjective, self-reporting scale (Samn-Perelli (1982))

• Completed post-shift
Measuring Fatigue - Results

Mainly Oceanic controllers at the end of a night shift

Fatigue Scores (Samn Perelli Scale)

- Fully alert, wide awake: 24% (Touchscreen data), 26% (i-pad data Jan-Feb), 26% (i-pad data Feb 16)
- Very lively, responsive but not at peak: 13% (Touchscreen), 20% (i-pad Jan-Feb), 24% (i-pad Feb 16)
- OK, somewhat fresh: 23% (Touchscreen), 24% (i-pad Jan-Feb), 24% (i-pad Feb 16)
- A little tired, less than fresh: 19% (Touchscreen), 19% (i-pad Jan-Feb), 14% (i-pad Feb 16)
- Moderately tired: 10% (Touchscreen), 8% (i-pad Jan-Feb), 6% (i-pad Feb 16)
- Let down: 3% (Touchscreen), 3% (i-pad Jan-Feb), 5% (i-pad Feb 16)
- Extremely tired, very difficult to concentrate: 3% (Touchscreen), 3% (i-pad Jan-Feb), 5% (i-pad Feb 16)
- Completely exhausted, unable to function effectively: 1% (Touchscreen), 1% (i-pad Jan-Feb), 1% (i-pad Feb 16)
Conclusions – Do we have a Problem with Fatigue in NATS?

• No – there is good evidence that fatigue risk is being managed effectively

• But - we should not be complacent, as fatigue can reduce people’s performance

• Our priorities are to:
  – Improve our understanding
  – Investigate how to collect objective measures of fatigue automatically
Airways

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Background / History

- Organisational change
  - Government department until 1987
  - State owned enterprise (financial / customer focus)
  - Move to risk based approach
  - Increasing legislative requirements for H&S, ER etc.
  - Pending ICAO fatigue risk management requirements
### Background / History

#### Demographics

<table>
<thead>
<tr>
<th>Staff breakdown:</th>
<th>Shift workers:</th>
<th>Shift groupings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Delivery 420</td>
<td><strong>Service Delivery:</strong></td>
<td><strong>Technology:</strong></td>
</tr>
<tr>
<td>Technology 220</td>
<td>-370 ATC</td>
<td>-20 Tech Co-ords (24/7)</td>
</tr>
<tr>
<td>Rest of business 160</td>
<td>-35 FS</td>
<td>-50 Tech (Day rosters + Stby)</td>
</tr>
<tr>
<td><strong>Total:</strong> 800 good people</td>
<td><strong>Technology:</strong></td>
<td></td>
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<td></td>
<td>-70 E&amp;M</td>
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Not a one size fits all solution
Fatigue Management Evolution

• Current Percriptive Limits for ATC
  • Very historic (Based from the 1970’s)
  • Mixture of industrial and legislative requirements
  • Backward rotating rosters
  • Seem to be on the low side of international practice
  • One size fits all approach
  • Structured roster change process
  • High degree of staff flexibility to choose roster options
Fatigue Management Evolution

- **Fatigue going forward**
  - ICAO guidance provides the improvement framework
  - Move to science based approach
  - Fatigue managed under H&S supported by WFP
  - Bio mathematical assessment of current rosters (FAID)
  - Cross functional fatigue management group established
    - Engaging the unions, plus external expert support
  - Established an online reporting system
  - Staff and management education program
  - Facilitated forward rotating roster trials (2 for 24/7 sectors)
Fatigue Management

• Summary
  • Firstly we won’t panic, no strong evidence of a major problem
  • Moving to make FRM embedded in our SMS
  • Collaboration (org, staff, unions) based on a scientific approach
  • Better understand our current measures (fatigue v industrial)
  • Use external expertise to assist (data modelling and fatigue)
  • Play the long game
Airservices Context

- 11% world’s surface
  - Busy city pairs during day
  - Significant volumes of traffic transit overnight across airspace
- Geographically dispersed
  - Mix of 24 hour and non-24 hour operations
- Traffic demand drives work schedules
  - Each ATC is individually rostered
- Mature Safety Management System
- No prescriptive requirements
Current Approach

- Work Schedules
- Education
- Promotion
- Assurance

Dual Accountability
Work Schedules

• Roster must comply with internal requirements
  • Number of consecutive shifts
  • Time off between shifts
  • Length of shift
  • Number of consecutive night shifts
  • Flow of rosters
  • Extended Rest Period between blocks of shifts
• More flexibility in backwards rotation for non-24 hour locations
• Based on scientific principles and results of two sleep surveys
Work Schedules

- Rosters must also:
  - Comply with requirements of labour agreement
  - Pass check using bio-mathematical model
Planned Rosters Change!

- Recognition that people get sick and have to take time off unexpectedly
- Allocation of additional duties seeks to minimise fatigue impact
  - Computer system identifies priority listing of ATCs to call out
  - Identifies need for risk assessments
  - Highlights if controls need to be applied on the shifts where fatigue risk is heightened
Assurance Reporting

- Quarterly reporting to line management
- Reviews with staff representatives
Key Lessons

- Scientific evidence to support change
- Safety as a driver for change
- Change management
  - Consistent messaging
  - Staying the course
  - Use of well-respected ‘change team’
- Complex rostering: complex fatigue management approach
  - Decision support tools
    - Ease workload for Line Managers
  - Workload intensive
Gap Analysis

Fatigue Management Initial Gap Analysis

Short questionnaire to identify where you stand

Understanding Your Score:

If the majority of your responses are Yes, your organisation needs to invest time and effort reviewing how to improve their approach to fatigue management.

If the majority of your responses are No, then your organisation may be in a good position to transfer its knowledge and provide to your colleagues in the CANSO Asia Pacific community which are working to evolve your approach to fatigue management.

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Summary

• Fatigue is another risk which needs to be managed
  – Approach needs to address the operational context
    • 24 hour versus non-24 hour ops
• Even the most mature ANSPs are on a journey to manage fatigue
  – All these ANSPs leverage off their SMS practices
What Can We Do Now

- Understand where your stand now? (Gap analysis)
- Are you in a position to modify your approach?
  - Considerations:
    - Education and awareness
    - Reviewing your work schedules to understand their impacts on sleep opportunities
    - Expand opportunities to report fatigue hazards or address fatigue in incident reporting and other assurance mechanisms
- Engage your regulator in efforts to deliver appropriate domestic regulators
  - Try not to get to copy and pasting from other States
Finally....

• What can CANSO Asia-Pac do to assist your ANSP?
• What are you going to do when you return to your office?
Factors Contributing to ATC Incidents in Europe

From Edwards et al., 2013