Preventing musculoskeletal disorders in train drivers

Musculoskeletal disorder risk Assessment for Train drivers tool (MAT tool)

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The plan

- Background
- What we did
- Introduction to the MAT tool
- Roll out of the MAT tool
- What next?

Courtesy of HSE
2009
- RSSB human factors team undertaking work on MSDs
- Successful claim by three train drivers against their train operating company (TOC) for carpal tunnel syndrome
- Key finding – lack of a suitable and sufficient risk assessment by TOC
- RSSB research project (T940) initiated
  - initiated by ATOC research idea
  - project part of the industry funded research programme
  - TOC position unlikely to be an isolated case
  - potential for improvement in management of MSD risk
What we did – Literature review (T940)

• Questions
  – What risk factors should be covered for MSDs in train drivers?
  – What legislation needs to be taken into account?
  – What tools are available to help identify relevant risk factors?
  – What controls are available?

• Findings
  – Many risk factors to take into account
  – The risk of train drivers suffering from work related MSDs is small however management of MSD risk is a growing concern
  – Compliance with Management of Health and Safety at Work Regulations (1999) and Provision and Use of Work Equipment Regulations (PUWER) (1998)
  – The need to undertake a suitable and sufficient risk assessment
  – Tools available did not take into account all necessary risk factors
  – Many generic controls cited in HSE guidance
What we did – Developed MAT tool (T940)

MSD Risk assessment tool

Overview

Musculoskeletal disorders
- What are MSDs?
- What causes MSDs?
- Who do MSDs affect?
- How to manage MSDs
- MSD myths
- Action to be taken on emergence of MSDs

Legislation
- Employer’s duties
- Civil vs Criminal Law
- European Directive on MSDs
- Rolling Stock Technical Specification for Interoperability (TSI)

Managing Health & Safety
- Policy
- Organising
- Communication
- Planning
- Implementing
- Measuring
- Auditing & reviewing

Risk assessment

Cab

Task
- Frequency
- Repetition
- Force
- Posture
- Breaks
- Work pace
- Other factors (including vibration, temperature and lighting)
- Duration of exposure
- Psychosocial factors

Individual
- Anthropometry

Results

Control measures

Guidance/ help

Glossary

References

Cab measurement methodology

Repetition data

Force data

Vibration

Posture and seat adjustability guidance

Guidance on exercises
What we did – Developed MAT tool (T940)

MAT tool – developed by RSSB
Any concerns about cab ergonomics should be discussed with the occupational health provider, especially where cab measurements do not accommodate the 5th percentile female to 95th percentile male user group.

Develop a way of ensuring that MSDs are considered during pre-employment, periodic and special medical examinations. Work with the occupational health provider to achieve this.

Discuss with the occupational health provider how to mitigate identified risks. Mitigations should be considered by the company as part of a cost-benefit exercise to determine which measures are reasonably practicable.
Cab assessment
### Cab assessment

- Reach to primary controls

<table>
<thead>
<tr>
<th></th>
<th>Rolling stock cab</th>
<th>Comparison with 5th %ile Female and 95th %ile Male static anthropometric data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td><strong>Percentile range covered</strong></td>
<td><strong>5th %ile Female</strong></td>
</tr>
<tr>
<td>Min</td>
<td>Max</td>
<td>Female to Male</td>
</tr>
<tr>
<td><strong>A</strong> Seat height (to base of DSD pedal)</td>
<td>467</td>
<td>788</td>
</tr>
<tr>
<td><strong>B</strong> Seat pan depth</td>
<td>535</td>
<td>585</td>
</tr>
<tr>
<td><strong>C</strong> Zone of convenient reach (reach distance to primary control)</td>
<td>680</td>
<td>1068</td>
</tr>
<tr>
<td><strong>D</strong> Armrest height</td>
<td>247</td>
<td>247</td>
</tr>
<tr>
<td><strong>E</strong> Underside of desk to base of DSD pedal</td>
<td>0</td>
<td>690</td>
</tr>
<tr>
<td><strong>F</strong> Knee well space - backrest to vertical under desk restriction</td>
<td>690</td>
<td>1005</td>
</tr>
<tr>
<td><strong>H</strong> Lumbar height (lower back support)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td><strong>I</strong> Distance between armrests</td>
<td>0</td>
<td>450</td>
</tr>
<tr>
<td><strong>J</strong> Seat pan (cushion) width</td>
<td>0</td>
<td>485</td>
</tr>
<tr>
<td><strong>K</strong> Knee well space width</td>
<td>0</td>
<td>740</td>
</tr>
</tbody>
</table>
Task assessment

• Four main parts
  – Frequency and repetition
  – Force
  – Awkward postures
  – Additional factors

• Answer questions which automatically generate scores

<table>
<thead>
<tr>
<th>The head or neck is:</th>
<th>Y/N ?</th>
</tr>
</thead>
<tbody>
<tr>
<td>In an almost neutral posture</td>
<td></td>
</tr>
<tr>
<td>Bent or twisted part of the time (e.g. 15-30%)</td>
<td>Yes</td>
</tr>
<tr>
<td>Bent or twisted more than half of the time (more than 50%)</td>
<td></td>
</tr>
<tr>
<td>Individual assessment</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Buttock to knee length</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image1" alt="Illustration" /></td>
<td>Measured horizontally from the most posterior part of the buttock to the front of the knee.</td>
</tr>
<tr>
<td><strong>Buttock to popliteal length</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image2" alt="Illustration" /></td>
<td>Measured horizontally from the most posterior part of the buttock to the underside of the knee.</td>
</tr>
</tbody>
</table>
Roll out of the MAT tool

- March 2012
  - Tool launched, briefing attended by 29 companies
  - Tool requested by 22 companies

- June 2014
  - Industry workshop to evaluate tool use and share good practice
  - Attended by 22 companies

- Feedback generally positive
  - Allows consistency of MSD risk assessment
  - Gives TOCs a better understanding of ergonomics
  - Cab assessment numbers understood by engineers
  - Reveals patterns of space provision in cabs
  - Uses a holistic approach
  - Use tool to assess design and placement of equipment
  - Tool content used as a basis for driver briefings eg, posture
What next?

- Some scope for improvements identified
  - Interpretation of cab and individual assessments
  - Removal of red and green colour coding from cab/ individual assessment
  - Updates to legislation and management of health and safety sections
  - Emphasis of holistic approach

- Tool updates underway to address these issues

- Continue to provide support to industry in the use of MAT
Thank you

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