Research Brief

Driver selection - development phase

T628 - July 2010

Background

The train driver selection criteria and assessment centre process have been, with a few exceptions, in their current form since 1994. Research project T340 'Psychometric testing - a review of the train driver selection process' was conducted in 2004/2005 to evaluate this process. It identified the strengths and weakness of the current process including some potential improvements. The psychometric assessment process is currently based on selection criteria that do not fully meet the requirements of modern train driving. For example, not enough emphasis is placed on the ability to maintain attention even with little physical activity. Some of the tests currently in use do not distinguish between good and poor candidates as well as they should. This means that there is a risk that candidates who do not have the right attributes could be selected and that the cost of administering the test is wasted. An industry-wide steering group was formed in 2006 to review the recommendations from T340, and identify where and how the current selection arrangements could be revised and improved. T628 was initiated to take the steering group's strategy forward.

Aims

1. Further develop the train driver selection criteria proposed in T340 and obtain industry agreement for the use of these selection criteria.
2. Coordinate with European activities (Technical Specification for Interoperability (TSI), EU Directive 2007/59/EC) in order that GB requirements are incorporated and align GB practice with Europe as far as reasonably practical.
3. Propose a revised train driver psychometric assessment process which will effectively measure the updated selection criteria, conform to good practice in selection, exclude unsuitable drivers and where possible enable potentially exceptional drivers to be distinguished:

    a. Identify or develop alternative or upgraded psychometric tests to replace the DTG and Group Bourdon and to assess any additional cognitive or psychomotor selection criteria, and demonstrate the suitability of

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these alternatives in terms of validity, reliability and practicality.

b Identify or develop alternative or upgraded methods for the measurement of behavioural criteria and demonstrate the suitability of the alternatives in terms of validity, reliability and practicality.

4 Evaluate the arrangements for the management of the train driver psychometric assessment process and propose alternative arrangements if weaknesses are apparent.

Method

1 The selection criteria were developed to take into account legislation, European practice and GB current and future operational requirements. Operational subject matter experts contributed operational requirements. Coordination with the Community of European Railways Psychologists Subgroup was used to collect information about European practice. The Driver Licensing Directive (2007/59/EC) and the conventional traffic operation and management Technical Specification of Interoperability (TSI 2006/920/EC) were reviewed and compatibility was built into the proposed criteria. The proposed selection criteria cover cognitive, psychomotor and behavioural attributes.

2 Off-the-shelf psychometric tests were reviewed and shortlisted to identify new tests to address each of the proposed criteria. The shortlisting took into account a range of factors such as reliability, validity, fairness, administration time and cost.

3 Two hundred and eighty four drivers and trainee drivers from eight companies completed the following shortlisted cognitive tests:

a The Test of Everyday Attention for Occupational Assessment (TEA-occ)

b The Tachistoscopic Traffic Test (TAVTMB)

c The Time Movement Anticipation Test (ZBA)

d The Simultaneous Capacity and Stress Tolerance Test (SIMKAP)

Performance data were collected for the driver and trainee driver sample. The results of the cognitive psychometric tests were compared to the performance data to assess how well the tests relate to safe performance, operational performance and classroom performance in the real-world. A set of acceptance criteria based on the European

Federation of Psychologists Association (EFPA) review model were developed to decide whether to recommend a test for inclusion in the future suite of psychometric assessment methods for use in GB.

4 No off-the-shelf tests that are available were considered suitable to assess the behavioural criteria for train driving in GB. Therefore, a new situational judgement questionnaire and multimodal interview were developed taking into account operational requirements and good practice in psychometric assessment. A simple assessment of written communication skills was also developed taking into account the types of reports that train drivers need to produce as part of their work.

5 Arthur D Little (ADL) was commissioned to review the current governance and management arrangements for train driver psychometric assessment. Stakeholder interviews and formal management evaluation methods such as the RACI (Responsible, Accountable, Consulted, Informed) matrix were used to identify the strengths and weaknesses of the current arrangements.

Findings

The proposed selection criteria developed as part of this project were endorsed by the project steering group. One additional criterion was identified subsequently in the Driver Licensing Directive. The addition of controlled motor coordination was also endorsed by the steering group.

All cognitive tests trialled met the core acceptance criteria although some customisation is needed before the tests are fully suitable for implementation. For example, the scoring rules need to be developed. In addition, the TEA-Occ needs to be complimented with an additional test of vigilance because it was found not to assess this selection criterion.

Tests to assess vigilance and controlled motor coordination were assessed and shortlisted using the same methodology used to shortlist the other cognitive tests. The WAFV and VIGIL tests of vigilance and sustained attention and the two-hand coordination test (2-HAND) were identified as the most promising options.

The bespoke methods for the assessment of the behavioural criteria and the written communicaions test have been successfully developed and are suitable to be trialled in future to assess their validity and reliability.

ADL concluded that the current governance and management arrangements for train driver psychometric assessment are sufficient for maintaining the status quo but do not provide a structured means to achieve change.

Conclusions and Recommendations

The following conclusions and recommendations developed as part of this project were endorsed by the project steering group on behalf of Operations Focus Group.

The cognitive tests that have been trialled and have met the acceptance criteria should be customised as required and then adopted as part of the GB suite of psychometric tests for train driver psychometric assessment.

The behavioural assessment methods and the written communications test that have been developed should be trialled to confirm their suitability to use as part of the suite of tests. Tests to assess cognitive and psychomotor assessment criteria not covered as part of this project should also be trialled.

Once these actions have been taken and with industry agreement, the new assessment criteria and suite of tests should be specified in an updated version of Railway Industry Standard RIS-3751-TOM *Train Driver Selection*.

A new governance group should be formed to develop industry strategy for train driver psychometric assessment.

Next steps

Research project T948 *Train Driver Selection - Implementation Phase* will conduct further trials to evaluate the behavioural assessment methods and outstanding cognitive tests. If these tests meet the acceptance criteria then, subject to industry approval, the new selection criteria and whole suite of tests will be specified in RIS-3751-TOM *Train Driver Selection.*

The Traffic Operations and Management Standards Committee and Interface Standards Coordination Committee endorsed a proposal to form a new industry governance group for train driver psychometric assessment. This was approved by the RSSB board at its meeting in July 2010 and a new governance group will be set up under the Traffic Operations and Management Standards Committee.

Benefits

This project has made steps towards the development of an updated driver selection process. T948 will take this development process through to implementation. The key benefits of an updated driver selection process which removes the weaknesses in the current process are:

- Enhanced alignment with the demands of modern train driving, European standards/ practice and legislative requirements.
- A decrease in the number of incidents that can be attributed to deficiencies/failures in the abilities and behaviour needed for safe train driving.
- Decreased driver training costs due to positive impact on:
  - The number of drivers selected who pass training first time and who will stay in the job for a long time.
  - The requirements for special monitoring / performance management during a driver's career.

In addition, the formation of a new governance group for train driver psychometric assessment will provide a means to set a clear industry strategy and to respond to changes in requirements more proactively.

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