



National Firefighter Selection Process  
National Firefighter Questionnaire (NFQ)  
**Technical Manual**





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Please note: This material has been developed specifically for use with the National Firefighter Questionnaire. It is not to be used for any purpose other than that for which it was originally designed. Portions of this manual should not be used separately.

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# Contents

|  |    |
|--|----|
| <b>Acknowledgements</b>                                    | 4  |
| <b>Section 1</b>   |    |
| Introduction   | 5  |
| <b>Section 2</b>   |    |
| Proper use of the National Firefighter Questionnaire (NFQ) | 6  |
| <b>Section 3</b>   |    |
| Overview of the NFQ  | 7  |
| <b>Section 4</b>   |    |
| Description of the NFQ                                     | 8  |
| <b>Section 5</b>   |    |
| The Development of the NFQ                                 | 10 |
| <b>Section 6</b>   |    |
| The NFQ Technical Information                              | 14 |
| <b>Appendix A</b>  |    |
| Phase I Piloting Sample Statistics                         | 28 |
| <b>Appendix B</b>  |    |
| Phase II Piloting Sample Statistics                        | 30 |

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# Section 1

## Introduction

- 1.1 This document records the development of the National Firefighter Questionnaire and presents important technical information about the test.
- 1.2 The document is split into the following sections:
  - Proper use of the National Firefighter Questionnaire (NFQ)
  - Overview of the NFQ
  - Description of the NFQ
  - The Development of the NFQ
  - The NFQ – Technical Information.

# Section 2

## Proper use of the National Firefighter Questionnaire (NFQ)

- 2.1 The NFQ is for use only as part of the National Firefighter Selection process. This document outlines standards concerning the use and availability of the NFQ and is in line with those guidelines outlined by the British Psychological Society (BPS) and current opinion concerning best professional practice in the use and supply of assessment tools.
- 2.2 **Cautionary Note** – Assessment tools and their results are for use by appropriately trained and authorised users only. It is the responsibility of authorised users to ensure that appropriate measures are taken to safeguard the security, confidentiality and proper use of the NFQ and candidates' assessment results.

# Section 3

## Overview of the NFQ

### 3.1 Introduction

3.1.1 The rationale for the development of the NFQ has been guided by the following criteria:

- The NFQ has been designed to assess candidates against the a sub-set of the National Firefighter Personal Qualities and Attributes (PQAs) in order to select those people who have the potential to become effective Firefighters
- Whilst it was important that the NFQ had a clear Firefighting theme, the content of the assessment has been designed so as not to disadvantage those without direct knowledge or experience of the Firefighter role.

### 3.2 The National Firefighter Questionnaire (NFQ)

3.2.1 The NFQ explores those motivations and attitudes important to success as a Firefighter. Candidates are presented with a series of statements relating to motivations and attitudes and asked to report the extent to which they agree with each statement (*eg To my knowledge I have never been considered unreliable*).

3.2.2 Number of questions: 127

3.2.3 Time limit: There is no set limit for the completion of the NFQ. However, candidates usually complete the NFQ in approximately 40 minutes.

### 3.3 Additional information and administration

3.3.1 A more detailed description of the NFQ can be found in Section 4. The NFQ itself should be examined to gain a full appreciation of its content.

3.3.2 The NFQ is administered by hand using a paper question booklet and answer sheet. Full instructions covering the administration of the NFQ can be found in the separate NFQ and NFA Tests Administration Instructions. Scoring is done by computer through scanning of candidates' answer sheets.

# Section 4

## Description of the NFQ

### 4.1 Aim

4.1.1 The NFQ assesses Firefighter candidates' attitudes and motivation in relation to seven scales, each based on one of the Fire and Rescue Service Personal Qualities and Attributes (PQAs). The following provides a brief description of the scales:

- Working with Others – works effectively with others both within the Fire and Rescue Service and the community
- Commitment to Diversity and Integrity – understands and respects diversity and adopts a fair and ethical approach to others
- Confidence and Resilience – maintains a confident and resilient attitude in highly challenging situations
- Commitment to Excellence – Adopts a conscientious and proactive approach to work to achieve and maintain excellent standards
- Commitment to Development – committed to and able to develop self and others
- Situational Awareness – maintains an active awareness of the environment to promote safe and effective working
- Openness to Change – is open to change and actively seeks to support it Rescue Service and in the community.

### 4.2 Composition

4.2.1 The assessment consists of 127 questions, each question being designed to explore a certain aspect of one of the seven scales. All of the questions are designed to be able to be answered by candidates without direct experience and knowledge of the Fire and Rescue Service.

## 4.3 Practice Test Booklet

- 4.3.1 A Practice Booklet has been developed for the NFQ. The purpose of the NFQ Practice Booklet is to allow candidates to familiarise themselves with the content of the questionnaire and the style of the questions. It also provides useful information for candidates on the testing session itself. The NFQ Practice Booklet should be sent to candidates prior to their attendance at the NFQ testing session.

## 4.4 Administration Instructions

- 4.4.1 Complete Administration Instructions have been provided for the NFQ. These include instructions for the beginning of the testing session, standardised instructions that should be read verbatim to administer the NFQ (plus the NFA Tests) and instructions for closing the testing session.

## 4.5 Scoring and Feedback

- 4.5.1 Scoring is done by computer through scanning of candidates' answer sheets. An answer key and text for feedback letters have been provided separately.

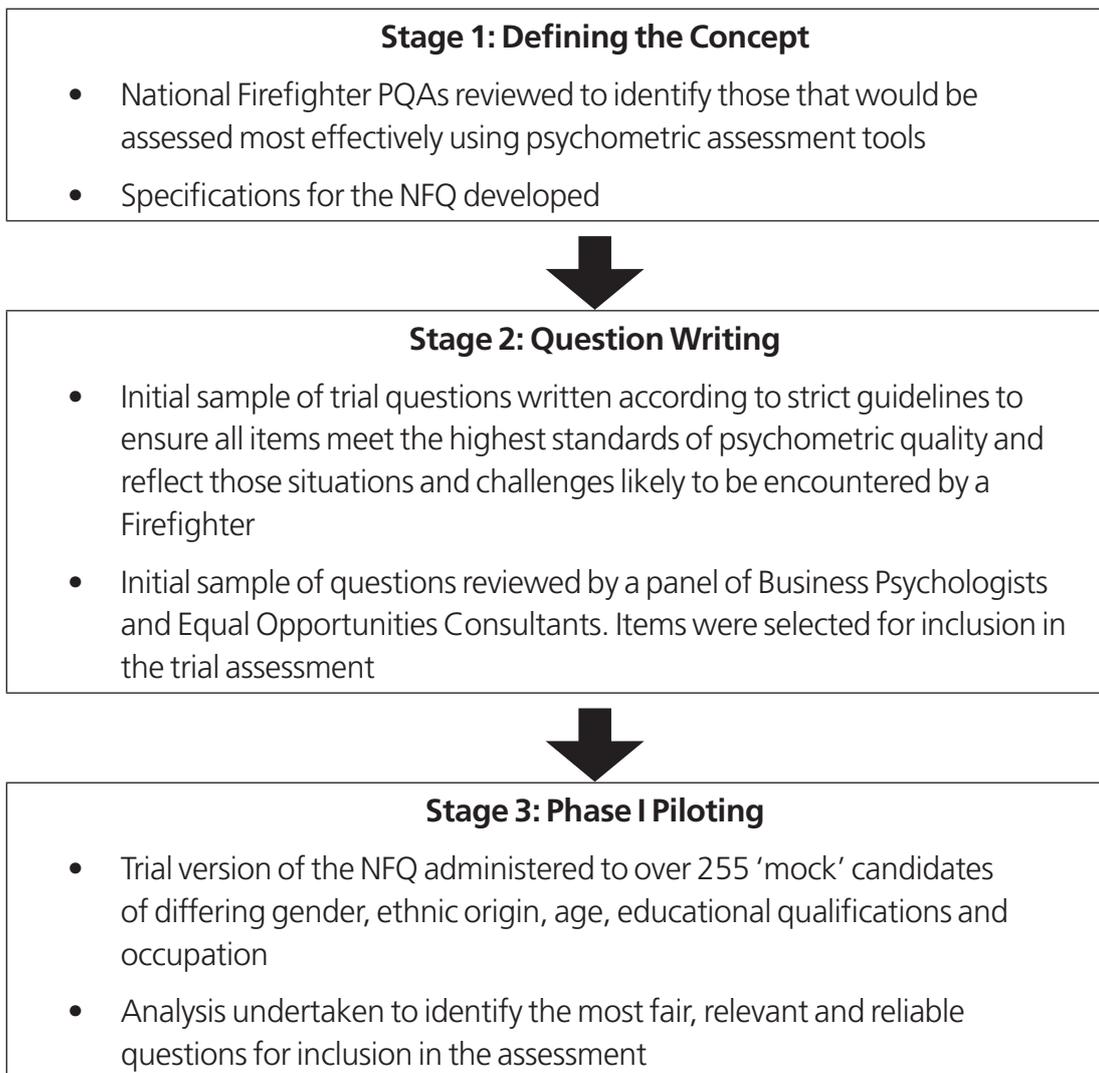
# Section 5

## The development of the NFQ

### 5.1 Overview of the development process

5.1.1 The NFQ has undergone a rigorous four stage development procedure designed to ensure that the final psychometric assessments are as fair and effective as possible.

5.1.2 Figure 1 presents a general overview of the NFQ development process. More specific details concerning the development of the questionnaire follow.





#### **Stage 4: Phase II Piloting**

- Final versions of the NFQ administered to 93 'mock' candidates of differing gender, ethnic origin, age, educational qualifications and occupation. Particular care was taken at this stage to ensure the standardisation sample was as similar in background and experience to Firefighter applicants and whenever possible used actual live applicants (eg candidates must have had an interest in becoming a Firefighter)
- Analysis undertaken to confirm the fairness and effectiveness of the final questions and to develop a standardised scoring keys for the assessment

*Figure 1 – General Overview of the NFQ Development Process*

## 5.2 Stage 1: Defining the Concept

- 5.2.1 The starting point for the development of the NFQ, and the other assessment tools that comprise the national Firefighter selection process, was the development of a core set of PQAs that defined the effective Firefighter. Detailed information concerning the National Firefighter PQAs development process can be found in 'Development of the National Firefighter Selection Tests: Psychological Report (2005)'.
- 5.2.2 The PQAs were reviewed to identify those criteria that could be assessed most effectively by psychometric assessment and those criteria that might be more adequately assessed by other methods. This review, therefore, identified the specific PQAs that the NFQ should assess and confirmed the need to develop a bespoke personality instrument.
- 5.2.3 The remainder of this section outlines more specific information concerning the procedure followed to develop the NFQ.

## 5.3 Stage 2: Question Writing

- 5.3.1 From an examination of the National Firefighter PQAs, it was clear that candidates' personality, values and interests were critical to many of these. The PQAs were, therefore, used as the focus for the development of items for the NFQ.
- 5.3.2 A number of items were written in order to assess the full breadth of seven of the PQAs. Both positively and negatively worded items were constructed for each of the PQAs. The aim at this stage was to develop far more questions than were actually needed and to use the two phases of piloting to ensure that only the fairest and more effective questions were selected for the final questionnaire.

- 5.3.3 At this stage of the development process changes were made to the PQAs and the design specification in the light of the Bain Report and White Paper. Additional questions were written, particularly to reflect the assessment of an additional PQA (ie Openness to Change) and other questions were amended.
- 5.3.4 A panel reviewed these initial items to ensure they were both acceptable and relevant to people from outside of the Fire and Rescue Service. Equal Opportunity experts also reviewed the questions to ensure that they did not unfairly disadvantage candidates from minority groups. As a result of the review process minor changes were made to the questions. The questions were then randomised and included in a 244 item pilot version of the questionnaire.

## 5.4 Stage 3: Phase I Piloting

- 5.4.1 The trial questionnaire was administered initially to 255 'mock' candidates as part of Phase I piloting. These were trainee firefighters, individuals who were interested in joining the Fire and Rescue Service, and individuals attending public service courses. Statistics for the Phase I piloting sample can be found in Appendix A.
- 5.4.2 The data from the piloting was analysed to identify the most effective and fair questions for the 'draft' version of the NFQ. The responses of majority and minority candidates were analysed and those items that demonstrated ethnic or gender bias were removed (eg where white candidates responded significantly differently to black and minority ethnic candidates).
- 5.4.3 The internal reliability of the scales and correlations between individual items and scale total scores were also examined. Those items that did not correlate significantly with the scale total scores were eliminated, as they were found not to measure the same PQA area as other questions within the scale in question.
- 5.4.4 As a result of the analysis the 'best' items were selected to be used in the draft version. The draft version of the NFQ comprised 134 items.

## 5.5 Stage 4: Phase II Piloting

- 5.4.1 The NFQ in the revised and reduced form was administered to a total of 93 actual applicants going through existing Firefighter selection processes. Performance on the NFQ did not form any part of the selection decision made. The NFQ did not form any part of those FRSs' Firefighter selection processes. Statistics for the Phase II piloting sample can be found in Appendix B.
- 5.4.2 Constraints on the time available to collect data and on the number of FRSs able to participate meant that it was not possible to collect sufficient data from black and minority ethnic and female candidates to allow for meaningful analysis looking specifically at these groups. As a result this analysis will need to be conducted during the early implementation of the NFS process.
- 5.4.3 Further analysis of the psychometric properties of the items was completed to confirm the structure and internal consistency of the questionnaire and to provide relevant norm data. Results of the analysis reduced the final test to 127 items.

# Section 6

## The NFQ technical information

### 6.1 Introduction

6.1.1 This section contains the following technical information and data:

- Summary statistics – standardisation sample
- Norm tables
- Reliability
- NFQ Scale inter-correlations
- Adverse impact
- Validity.

### 6.1 Summary statistics – standardisation sample

6.2.1 Responses to each question are scored on a 1 to 5 scale where 1 is a negative response and 5 a positive response.

|  | Sample size | Minimum score | Maximum score | Mean score (raw score) | Standard Deviation (raw score) |
|--|-------------|---------------|---------------|------------------------|--------------------------------|
| <b>Working with Others</b><br>(25 questions)       | 93          | 82            | 125           | 109.39                 | 8.72                           |
| <b>Commitment to Diversity</b><br>(22 questions)   | 93          | 77            | 110           | 98.13                  | 6.91                           |
| <b>Confidence and Resilience</b><br>(19 questions) | 93          | 62            | 99            | 77.48                  | 7.84                           |
| <b>Commitment to Excellence</b><br>(23 questions)  | 93          | 70            | 114           | 96.19                  | 8.26                           |
| <b>Commitment to Development</b><br>(16 questions) | 93          | 47            | 80            | 69.44                  | 5.43                           |
| <b>Situational Awareness</b><br>(11 questions)     | 93          | 30            | 54            | 46.48                  | 4.25                           |
| <b>Openness to Change</b><br>(11 questions)        | 93          | 31            | 52            | 43.53                  | 4.44                           |

6.2.3 Please note that the NFQ mean score differences below are reported in terms of standard T scores.

|                                  | <b>Gender</b> | <b>Sample size</b> | <b>Mean score<br/>(T score)</b> | <b>Standard Deviation<br/>(T-score)</b> |
|----------------------------------|---------------|--------------------|---------------------------------|---|
| <b>Working with Others</b>       | Male          | 91                 | 47.78                           | 9.98                                    |
|                                  | Female        | 2                  | 60.44                           | 5.67                                    |
| <b>Commitment to Diversity</b>   | Male          | 91                 | 49.87                           | 10.06                                   |
|                                  | Female        | 2                  | 55.60                           | 6.14                                    |
| <b>Confidence and Resilience</b> | Male          | 91                 | 50.01                           | 10.11                                   |
|                                  | Female        | 2                  | 49.02                           | 0.00                                    |
| <b>Commitment to Excellence</b>  | Male          | 91                 | 49.83                           | 9.98                                    |
|                                  | Female        | 2                  | 57.64                           | 9.42                                    |
| <b>Commitment to Development</b> | Male          | 91                 | 49.89                           | 10.09                                   |
|                                  | Female        | 2                  | 54.71                           | 2.60                                    |
| <b>Situational Awareness</b>     | Male          | 91                 | 49.95                           | 10.09                                   |
|                                  | Female        | 2                  | 52.40                           | 4.99                                    |
| <b>Openness to Change</b>        | Male          | 91                 | 49.95                           | 10.11                                   |
|                                  | Female        | 2                  | 52.21                           | 1.60                                    |

6.2.4 While the analysis of mean differences between female and male candidates was conducted, the small sample size of female candidates (n=2) means that the results of the analysis can not be generalised to what would be found in a larger sample.

|                                  | <b>Ethnic origin</b>      | <b>Sample size</b> | <b>Mean score<br/>(T score)</b> | <b>Standard Deviation<br/>(T score)</b> |
|----------------------------------|---------------------------|--------------------|---------------------------------|---|
| <b>Working with Others</b>       | White                     | 82                 | 51.19                           | 9.15                                    |
|                                  | Black and minority ethnic | 8                  | 42.53                           | 9.38                                    |
| <b>Commitment to Diversity</b>   | White                     | 82                 | 50.85                           | 8.86                                    |
|                                  | Black and minority ethnic | 8                  | 45.11                           | 13.79                                   |
| <b>Confidence and Resilience</b> | White                     | 82                 | 50.99                           | 8.97                                    |
|                                  | Black and minority ethnic | 8                  | 42.89                           | 14.20                                   |
| <b>Commitment to Excellence</b>  | White                     | 82                 | 50.64                           | 9.94                                    |
|                                  | Black and minority ethnic | 8                  | 45.99                           | 8.93                                    |
| <b>Commitment to Development</b> | White                     | 82                 | 50.59                           | 9.19                                    |
|                                  | Black and minority ethnic | 8                  | 48.05                           | 8.29                                    |
| <b>Situational Awareness</b>     | White                     | 82                 | 51.08                           | 8.85                                    |
|                                  | Black and minority ethnic | 8                  | 44.16                           | 10.82                                   |
| <b>Openness to Change</b>        | White                     | 82                 | 50.83                           | 9.95                                    |
|                                  | Black and minority ethnic | 8                  | 45.43                           | 9.39                                    |

6.2.5 While the analysis of mean differences between white and black and minority ethnic candidates was conducted, the small sample size of black and minority ethnic candidates (n=8) means that the results of the analysis are not meaningful. They can not be generalised to what would be found in a real life selection setting.

## 6.3 NFQ Norm tables

6.3.1 These norm tables have been provided so that the raw scores totals for each PQA scale can be converted into standardised T scores. T scores should be used when looking at test performance as they compare a candidate’s scores against a representative group of test takers and allow the meaningful interpretation of test performance.<sup>1</sup>

| <b>Working with Others</b> | <b>T Score</b> | <b>Working with Others</b> | <b>T Score</b> | <b>Working with Others</b> | <b>T Score</b> |
|----------------------------|----------------|----------------------------|----------------|----------------------------|----------------|
| <b>Total raw Score</b>     |                | <b>Total raw Score</b>     |                | <b>Total raw Score</b>     |                |
| <b>(25 questions)</b>      |                | <b>(25 questions)</b>      |                | <b>(25 questions)</b>      |                |
| 25                         | -46.8          | 64                         | -2.0           | 102                        | 41.5           |
| 26                         | -45.6          | 65                         | -0.9           | 103                        | 42.7           |
| 27                         | -44.5          | 66                         | 0.2            | 104                        | 43.8           |
| 28                         | -43.3          | 67                         | 1.4            | 105                        | 45.0           |
| 29                         | -42.2          | 68                         | 2.5            | 106                        | 46.1           |
| 30                         | -41.0          | 69                         | 3.7            | 107                        | 47.2           |
| 31                         | -39.9          | 70                         | 4.8            | 108                        | 48.4           |
| 32                         | -38.7          | 71                         | 6.0            | 109                        | 49.5           |
| 33                         | -37.6          | 72                         | 7.1            | 110                        | 50.7           |
| 34                         | -36.4          | 73                         | 8.3            | 111                        | 51.8           |
| 35                         | -35.3          | 74                         | 9.4            | 112                        | 53.0           |
| 36                         | -34.2          | 75                         | 10.6           | 113                        | 54.1           |
| 37                         | -33.0          | 76                         | 11.7           | 114                        | 55.2           |
| 38                         | -31.9          | 77                         | 12.8           | 115                        | 56.4           |
| 39                         | -30.7          | 78                         | 14.0           | 116                        | 57.6           |
| 40                         | -29.6          | 79                         | 15.1           | 117                        | 58.7           |
| 41                         | -28.4          | 80                         | 16.3           | 118                        | 59.9           |
| 42                         | -27.2          | 81                         | 17.4           | 119                        | 61.0           |
| 43                         | -26.1          | 82                         | 18.6           | 120                        | 62.2           |
| 44                         | -25.0          | 83                         | 19.7           | 121                        | 63.3           |
| 45                         | -23.8          | 84                         | 20.9           | 122                        | 64.5           |
| 46                         | -22.7          | 85                         | 22.0           | 123                        | 65.6           |
| 47                         | -21.5          | 86                         | 23.2           | 124                        | 66.7           |
| 48                         | -20.4          | 87                         | 24.3           | 125                        | 67.9           |
| 49                         | -19.2          | 88                         | 25.5           |                            |                |
| 50                         | -18.1          | 89                         | 26.6           |                            |                |
| 51                         | -17.0          | 90                         | 27.8           |                            |                |
| 52                         | -15.8          | 91                         | 28.9           |                            |                |
| 53                         | -14.7          | 92                         | 30.0           |                            |                |
| 54                         | -13.5          | 93                         | 31.2           |                            |                |
| 55                         | -12.4          | 94                         | 32.3           |                            |                |
| 56                         | -11.2          | 95                         | 33.5           |                            |                |
| 57                         | -10.1          | 96                         | 34.6           |                            |                |
| 58                         | -8.9           | 97                         | 35.8           |                            |                |
| 59                         | -7.8           | 98                         | 36.9           |                            |                |
| 60                         | -6.6           | 99                         | 38.1           |                            |                |
| 61                         | -5.5           | 100                        | 39.2           |                            |                |
| 62                         | -4.3           | 101                        | 40.4           |                            |                |
| 63                         | -3.2           | 102                        | 41.5           |                            |                |

<sup>1</sup> Please note that the scoring method used to create these Norm Tables was updated in December 2005 and revised Norm Tables were issued at that time.

| <b>Commitment to Diversity<br/>Total raw Score<br/>(22 questions)</b> | <b>T Score</b> | <b>Commitment to Diversity<br/>Total raw Score<br/>(22 questions)</b> | <b>T Score</b> |
|---|----------------|---|----------------|
| 22  | -60.2          | 68  | 6.4            |
| 23  | -58.7          | 69  | 7.8            |
| 24  | -57.3          | 70  | 9.3            |
| 25  | -55.8          | 71  | 10.7           |
| 26  | -54.4          | 72  | 12.2           |
| 27  | -52.9          | 73  | 13.6           |
| 28  | -51.5          | 74  | 15.1           |
| 29  | -50.0          | 75  | 16.5           |
| 30  | -48.6          | 76  | 18.0           |
| 31  | -47.1          | 77  | 19.4           |
| 32  | -45.7          | 78  | 20.9           |
| 33  | -44.2          | 79  | 22.3           |
| 34  | -42.8          | 80  | 23.8           |
| 35  | -41.4          | 81  | 25.2           |
| 36  | -39.9          | 82  | 26.7           |
| 37  | -38.5          | 83  | 28.1           |
| 38  | -37.0          | 84  | 29.5           |
| 39  | -35.6          | 85  | 31.0           |
| 40  | -34.1          | 86  | 32.4           |
| 41  | -32.7          | 87  | 33.9           |
| 42  | -31.2          | 88  | 35.3           |
| 43  | -29.8          | 89  | 36.8           |
| 44  | -28.3          | 90  | 38.2           |
| 45  | -26.9          | 91  | 39.7           |
| 46  | -25.4          | 92  | 41.1           |
| 47  | -24.0          | 93  | 42.6           |
| 48  | -22.5          | 94  | 44.0           |
| 49  | -21.1          | 95  | 45.5           |
| 50  | -19.6          | 96  | 46.9           |
| 51  | -18.2          | 97  | 48.4           |
| 52  | -16.7          | 98  | 49.8           |
| 53  | -15.3          | 99  | 51.2           |
| 54  | -13.9          | 100   | 52.7           |
| 55  | -12.4          | 101   | 54.1           |
| 56  | -11.0          | 102   | 55.6           |
| 57  | -9.5           | 103   | 57.0           |
| 58  | -8.1           | 104   | 58.5           |
| 59  | -6.6           | 105   | 59.9           |
| 60  | -5.2           | 106   | 61.4           |
| 61  | -3.7           | 107   | 62.8           |
| 62  | -2.3           | 108   | 64.3           |
| 63  | -0.8           | 109   | 65.7           |
| 64  | 0.6            | 110   | 67.2           |
| 65  | 2.0            |   |                |
| 66  | 3.5            |   |                |
| 67  | 5.0            |   |                |

| <b>Confidence &amp; Resilience<br/>Total raw Score<br/>(19 questions)</b> | <b>T Score</b> | <b>Confidence &amp; Resilience<br/>Total raw Score<br/>(19 questions)</b> | <b>T Score</b> |
|---|----------------|---|----------------|
| 19  | -24.6          | 68  | 37.9           |
| 20  | -23.3          | 69  | 39.2           |
| 21  | -22.0          | 70  | 40.4           |
| 22  | -20.8          | 71  | 41.7           |
| 23  | -19.5          | 72  | 43.0           |
| 24  | -18.2          | 73  | 44.3           |
| 25  | -16.9          | 74  | 45.6           |
| 26  | -15.7          | 75  | 46.8           |
| 27  | -14.4          | 76  | 48.1           |
| 28  | -13.1          | 77  | 49.4           |
| 29  | -11.8          | 78  | 50.7           |
| 30  | -10.6          | 79  | 51.9           |
| 31  | -9.3           | 80  | 53.2           |
| 32  | -8.0           | 81  | 54.5           |
| 33  | -6.7           | 82  | 55.8           |
| 34  | -5.4           | 83  | 57.0           |
| 35  | -4.2           | 84  | 58.3           |
| 36  | -2.9           | 85  | 59.6           |
| 37  | -1.6           | 86  | 60.9           |
| 38  | -0.3           | 87  | 62.1           |
| 39  | 0.9            | 88  | 63.4           |
| 40  | 2.1            | 89  | 64.7           |
| 41  | 3.5            | 90  | 66.0           |
| 42  | 4.7            | 91  | 67.2           |
| 43  | 6.0            | 92  | 68.5           |
| 44  | 7.3            | 93  | 69.8           |
| 45  | 8.6            | 94  | 71.1           |
| 46  | 9.8            | 95  | 72.3           |
| 47  | 11.1           |   |                |
| 48  | 12.4           |   |                |
| 49  | 13.7           |   |                |
| 50  | 14.9           |   |                |
| 51  | 16.2           |   |                |
| 52  | 17.5           |   |                |
| 53  | 18.8           |   |                |
| 54  | 20.0           |   |                |
| 55  | 21.3           |   |                |
| 56  | 22.6           |   |                |
| 57  | 23.8           |   |                |
| 58  | 25.1           |   |                |
| 59  | 26.4           |   |                |
| 60  | 27.7           |   |                |
| 61  | 29.0           |   |                |
| 62  | 30.2           |   |                |
| 63  | 31.5           |   |                |
| 64  | 32.8           |   |                |
| 65  | 34.0           |   |                |
| 66  | 35.3           |   |                |
| 67  | 36.6           |   |                |

| <b>Commitment to Excellence</b><br><b>Total raw Score</b><br><b>(23 questions)</b> | <b>T Score</b> | <b>Commitment to Excellence</b><br><b>Total raw Score</b><br><b>(23 questions)</b> | <b>T Score</b> |
|--|----------------|--|----------------|
| 23   | -38.6          | 72   | 20.7           |
| 24   | -37.4          | 73   | 21.9           |
| 25   | -36.9          | 74   | 23.1           |
| 26   | -35.0          | 75   | 24.3           |
| 27   | -33.8          | 76   | 25.5           |
| 28   | -32.5          | 77   | 26.8           |
| 29   | -31.3          | 78   | 28.0           |
| 30   | -30.1          | 79   | 29.2           |
| 31   | -28.9          | 80   | 30.4           |
| 32   | -27.7          | 81   | 31.6           |
| 33   | -26.5          | 82   | 32.8           |
| 34   | -25.3          | 83   | 34.0           |
| 35   | -24.1          | 84   | 35.2           |
| 36   | -22.9          | 85   | 36.4           |
| 37   | -21.6          | 86   | 37.7           |
| 38   | -20.4          | 87   | 38.9           |
| 39   | -19.2          | 88   | 40.1           |
| 40   | -18.0          | 89   | 41.3           |
| 41   | -16.8          | 90   | 42.5           |
| 42   | -15.6          | 91   | 43.7           |
| 43   | -14.4          | 92   | 44.9           |
| 44   | -13.2          | 93   | 46.1           |
| 45   | -12.0          | 94   | 47.3           |
| 46   | -10.8          | 95   | 48.5           |
| 47   | -9.5           | 96   | 49.8           |
| 48   | -8.3           | 97   | 51.0           |
| 49   | -7.1           | 98   | 52.2           |
| 50   | -5.9           | 99   | 53.4           |
| 51   | -4.7           | 100  | 54.6           |
| 52   | -3.5           | 101  | 55.8           |
| 53   | -2.3           | 102  | 57.0           |
| 54   | -1.1           | 103  | 58.2           |
| 55   | 0.1            | 104  | 59.4           |
| 56   | 1.3            | 105  | 60.7           |
| 57   | 2.5            | 106  | 61.9           |
| 58   | 3.8            | 107  | 63.1           |
| 59   | 5.0            | 108  | 64.3           |
| 60   | 6.2            | 109  | 65.5           |
| 61   | 7.4            | 110  | 66.7           |
| 62   | 8.6            | 111  | 67.9           |
| 63   | 9.8            | 112  | 69.1           |
| 64   | 11.0           | 113  | 70.3           |
| 65   | 12.2           | 114  | 71.6           |
| 66   | 13.4           | 115  | 72.8           |
| 67   | 14.7           |  |                |
| 68   | 15.9           |  |                |
| 69   | 17.1           |  |                |
| 70   | 18.3           |  |                |
| 71   | 19.5           |  |                |

| <b>Commitment to Development<br/>Total raw Score<br/>(16 questions)</b> | <b>T Score</b> | <b>Commitment to Development<br/>Total raw Score<br/>(16 questions)</b> | <b>T Score</b> |
|---|----------------|---|----------------|
| 16  | -48.4          | 62  | 36.3           |
| 17  | -46.6          | 63  | 38.1           |
| 18  | -44.7          | 64  | 40.0           |
| 19  | -42.9          | 65  | 41.8           |
| 20  | -41.0          | 66  | 43.7           |
| 21  | -39.2          | 67  | 45.5           |
| 22  | -37.4          | 68  | 47.3           |
| 23  | -35.           | 69  | 49.2           |
| 24  | -33.7          | 70  | 51.0           |
| 25  | -31.8          | 71  | 52.9           |
| 26  | -30            | 72  | 54.7           |
| 27  | -28.1          | 73  | 56.5           |
| 28  | -26.3          | 74  | 58.4           |
| 29  | -24.5          | 75  | 60.2           |
| 30  | -22.6          | 76  | 62.1           |
| 31  | -20.8          | 77  | 63.9           |
| 32  | -18.9          | 78  | 65.8           |
| 33  | -17.1          | 79  | 67.6           |
| 34  | -15.3          | 80  | 69.4           |
| 35  | -13.4          |   |                |
| 36  | -11.6          |   |                |
| 37  | -9.7           |   |                |
| 38  | -7.9           |   |                |
| 39  | -6.0           |   |                |
| 40  | -4.2           |   |                |
| 41  | -2.4           |   |                |
| 42  | -0.5           |   |                |
| 43  | 1.3            |   |                |
| 44  | 3.1            |   |                |
| 45  | 5.0            |   |                |
| 46  | 6.8            |   |                |
| 47  | 8.7            |   |                |
| 48  | 10.5           |   |                |
| 49  | 12.3           |   |                |
| 50  | 14.2           |   |                |
| 51  | 16.0           |   |                |
| 52  | 17.9           |   |                |
| 53  | 19.7           |   |                |
| 54  | 21.6           |   |                |
| 55  | 23.4           |   |                |
| 56  | 25.2           |   |                |
| 57  | 27.1           |   |                |
| 58  | 28.9           |   |                |
| 59  | 30.8           |   |                |
| 60  | 32.6           |   |                |
| 61  | 34.5           |   |                |

| Situational Awareness<br>Total raw Score<br>(11 questions) | T Score |
|--|---------|
| 11   | -33.5   |
| 12   | -31.1   |
| 13   | -28.8   |
| 14   | -26.4   |
| 15   | -24.1   |
| 16   | -21.7   |
| 17   | -19.4   |
| 18   | -17.0   |
| 19   | -14.7   |
| 20   | -12.3   |
| 21   | -10.0   |
| 22   | -7.6    |
| 23   | -5.2    |
| 24   | -2.9    |
| 25   | -0.5    |
| 26   | 1.8     |
| 27   | 4.2     |
| 28   | 6.5     |
| 29   | 8.9     |
| 30   | 11.2    |
| 31   | 13.6    |
| 32   | 15.9    |
| 33   | 18.3    |
| 34   | 20.6    |
| 35   | 23.0    |
| 36   | 25.3    |
| 37   | 27.7    |
| 38   | 30.0    |
| 39   | 32.4    |
| 40   | 34.8    |
| 41   | 37.1    |
| 42   | 39.5    |
| 43   | 41.8    |
| 44   | 44.2    |
| 45   | 46.5    |
| 46   | 48.9    |
| 47   | 51.2    |
| 48   | 53.6    |
| 49   | 55.9    |
| 50   | 58.3    |
| 51   | 60.6    |
| 52   | 63.0    |
| 53   | 65.3    |
| 54   | 67.7    |
| 55   | 70.0    |

| <b>Openness to Change</b><br><b>Total raw Score</b><br><b>(11 questions)</b> | <b>T Score</b> |
|--|----------------|
| 11   | -23.3          |
| 12   | -21.0          |
| 13   | -18.8          |
| 14   | -16.5          |
| 15   | -14.2          |
| 16   | -12.0          |
| 17   | -9.7           |
| 18   | -7.5           |
| 19   | -5.2           |
| 20   | -3.0           |
| 21   | -0.7           |
| 22   | 1.5            |
| 23   | 3.8            |
| 24   | 6.0            |
| 25   | 8.3            |
| 26   | 10.5           |
| 27   | 12.8           |
| 28   | 15.0           |
| 29   | 17.3           |
| 30   | 19.5           |
| 31   | 21.8           |
| 32   | 24.0           |
| 33   | 26.3           |
| 34   | 28.5           |
| 35   | 30.8           |
| 36   | 33.0           |
| 37   | 35.3           |
| 38   | 37.5           |
| 39   | 39.8           |
| 40   | 42.0           |
| 41   | 44.3           |
| 42   | 46.5           |
| 43   | 48.8           |
| 44   | 51.0           |
| 45   | 53.3           |
| 46   | 55.6           |
| 47   | 57.8           |
| 48   | 60.1           |
| 49   | 62.3           |
| 50   | 64.6           |
| 51   | 66.8           |
| 52   | 69.1           |
| 53   | 71.3           |
| 54   | 73.6           |
| 55   | 75.83          |

## 6.4 Internal reliability

6.4.1 The internal reliability of the NFQ was assessed by the calculation of Cronbach's alpha. The scales' resulting levels of internal consistency are shown in the table below together with the standard error of measurement (SEM) for the scale.

|                                  | Sample size | Reliability | Sig.(2-tailed) | SEM  |
|----------------------------------|-------------|-------------|----------------|------|
| <b>Working with Others</b>       | 93          | 0.83        | p<0.05         | 4.12 |
| <b>Commitment to Diversity</b>   | 93          | 0.78        | p<0.05         | 4.69 |
| <b>Confidence and Resilience</b> | 93          | 0.81        | p<0.05         | 4.36 |
| <b>Commitment to Excellence</b>  | 93          | 0.82        | p<0.05         | 4.24 |
| <b>Commitment to Development</b> | 93          | 0.77        | p<0.05         | 4.79 |
| <b>Situational Awareness</b>     | 93          | 0.75        | p<0.05         | 5.00 |
| <b>Openness to Change</b>        | 93          | 0.69        | p<0.05         | 5.57 |

6.4.2 An index of 0.7 and above is considered to indicate an acceptable level of consistency for measures of personality, interests and motivation. Only one scale, Openness to Change has an internal reliability index below 0.7 ( $r=0.69$ ). It is only marginally below the acceptable figure and so is still considered as a scale with good internal reliability. These results, therefore, confirm that the NFQ has an acceptable level of internal consistency and provides important positive evidence of the instrument's reliability.

6.4.3 The reliability of the Openness to Change scale should be closely monitored during the early implementation of the NFS process.

## 6.5 NFQ scale inter-correlations

|                |                            | WWO | CtDiv | C&R   | CtEx  | CtDev | SA    | OTC   |
|----------------|----------------------------|-----|-------|-------|-------|-------|-------|-------|
| <b>WWO</b>     | <b>Pearson Correlation</b> |     | 0.83* | 0.65* | 0.76* | 0.63* | 0.74* | 0.49* |
|                | <b>Sig. (2-tailed)</b>     |     | .00   | .00   | .00   | .00   | .00   | .00   |
|                | <b>N</b>                   |     | 93    | 93    | 93    | 93    | 93    | 93    |
| <b>CtDiv</b>   | <b>Pearson Correlation</b> |     |       | 0.71* | 0.80* | 0.69* | 0.79* | 0.55* |
|                | <b>Sig.(2-tailed)</b>      |     |       | .00   | .00   | .00   | .00   | .00   |
|                | <b>N</b>                   |     |       | 93    | 93    | 93    | 93    | 93    |
| <b>C&amp;R</b> | <b>Pearson Correlation</b> |     |       |       | 0.75* | 0.52* | 0.71* | 0.55* |
|                | <b>Sig. (2-tailed)</b>     |     |       |       | .00   | .00   | .00   | .00   |
|                | <b>N</b>                   |     |       |       | 93    | 93    | 93    | 93    |
| <b>CtEx</b>    | <b>Pearson Correlation</b> |     |       |       |       | 0.67* | 0.74* | 0.51* |
|                | <b>Sig. (2-tailed)</b>     |     |       |       |       | .00   | .00   | .00   |
|                | <b>N</b>                   |     |       |       |       | 93    | 93    | 93    |
| <b>CtDev</b>   | <b>Pearson Correlation</b> |     |       |       |       |       | 0.68* | 0.47* |
|                | <b>Sig. (2-tailed)</b>     |     |       |       |       |       | .00   | .00   |
|                | <b>N</b>                   |     |       |       |       |       | 93    | 93    |
| <b>SA</b>      | <b>Pearson Correlation</b> |     |       |       |       |       |       | 0.63* |
|                | <b>Sig. (2-tailed)</b>     |     |       |       |       |       |       | .00   |
|                | <b>N</b>                   |     |       |       |       |       |       | 93    |
| <b>OTC</b>     | <b>Pearson Correlation</b> |     |       |       |       |       |       |       |
|                | <b>Sig. (2-tailed)</b>     |     |       |       |       |       |       |       |
|                | <b>N</b>                   |     |       |       |       |       |       |       |

\* Correlation is significant at the 0.01 level (2-tailed)

6.5.1 As the table above indicates, a moderate relationship was found between the NFQ's seven scales. This provides positive evidence that the seven scales are measuring similar, but not identical characteristics

## 6.6 Adverse impact

- 6.6.1 The number of participants from minority groups was below the threshold required in order to conduct meaningful and reliable analysis. Therefore, levels of adverse impact and mean differences between the test performance of majority and minority groups were not examined.
- 6.6.2 As soon as sufficient minority data has been collected during the early implementation of the NFS process such analysis will need to be conducted.

## 6.7 Validity

- 6.7.1 Further information concerning the NFQ's validity will be presented once the data on 'live' Firefighter candidates become available.

# Appendix A

## Phase I piloting sample statistics

### Demographics: National Firefighter Questionnaire

| Table 1: National Firefighter Questionnaire/Brigade |                        |      |
|---|------------------------|------|
| Brigade   | Number of Participants | %    |
| Berkshire   | 3                      | 1.2  |
| Hampshire   | 31                     | 12.2 |
| Lancashire  | 60                     | 2.35 |
| ODPM  | 13                     | 5.1  |
| Surrey/West Sussex                                  | 32                     | 12.5 |
| Tyne & Wear/Cleveland/Durham/Northumberland         | 88                     | 34.1 |
| West Midlands Fire & Rescue Service                 | 29                     | 11.4 |
| <b>Total</b>  | <b>256</b>             |      |

| Table 2: National Firefighter Questionnaire/Gender |                        |      |
|--|------------------------|------|
| Gender   | Number of Participants | %    |
| Male   | 170                    | 75.9 |
| Female   | 54                     | 24.1 |
| Undeclared   | 32                     |      |
| <b>Total</b>                                       | <b>256</b>             |      |

| Table 3: National Firefighter Questionnaire/Ethnic Origin |                        |      |
|---|------------------------|------|
| Ethnic Origin   | Number of Participants | %    |
| White   | 182                    | 84.7 |
| Black and minority ethnic                                 | 33                     | 15.3 |
| Undeclared  | 41                     |      |
| <b>Total</b>  | <b>256</b>             |      |

**Table 4: National Firefighter Questionnaire/Age**

| <b>Age</b>   | <b>Number of Participants</b> | <b>%</b> |
|--------------|-------------------------------|----------|
| 16-20        | 52                            | 23.2     |
| 21-25        | 69                            | 30.8     |
| 26-30        | 41                            | 18.3     |
| 31-35        | 34                            | 15.2     |
| 36-40        | 18                            | 8.0      |
| 41-45        | 9                             | 4.0      |
| 45+          | 1                             | 0.4      |
| Undeclared   | 32                            |          |
| <b>Total</b> | <b>256</b>                    |          |

**Table 5: National Firefighter Questionnaire/Disability**

| <b>Disability</b> | <b>Number of Participants</b> | <b>%</b> |
|-------------------|-------------------------------|----------|
| Yes               | 6                             | 2.7      |
| No                | 218                           | 97.3     |
| Undeclared        | 32                            |          |
| <b>Total</b>      | <b>255</b>                    |          |

# Appendix B

## Phase II piloting sample statistics

| Table 6: National Firefighter Questionnaire/Brigade |                        |      |
|---|------------------------|------|
| Brigade   | Number of Participants | %    |
| Hampshire   | 13                     | 14.0 |
| West Midlands                                       | 51                     | 54.8 |
| West Yorkshire                                      | 29                     | 31.2 |
| <b>Total</b>  | <b>93</b>              |      |

| Table 7: National Firefighter Questionnaire/Gender |                        |      |
|--|------------------------|------|
| Gender   | Number of Participants | %    |
| Male   | 91                     | 97.8 |
| Female   | 2                      | 2.2  |
| <b>Total</b>                                       | <b>93</b>              |      |

| Table 8: National Firefighter Questionnaire/Ethnicity |                        |      |
|---|------------------------|------|
| Ethnic Origin   | Number of Participants | %    |
| White   | 82                     | 91.1 |
| Black and minority ethnic                             | 8                      | 8.9  |
| Undeclared  | 3                      |      |
| <b>Total</b>  | <b>93</b>              |      |

| Table 9: National Firefighter Questionnaire/Age |                        |      |
|---|------------------------|------|
| Age   | Number of Participants | %    |
| 16-20   | 18                     | 19.4 |
| 21-25   | 38                     | 40.9 |
| 26-30   | 15                     | 16.1 |
| 31-35   | 15                     | 16.1 |
| 36-40   | 7                      | 7.5  |
| <b>Total</b>                                    | <b>93</b>              |      |

| <b>Table 10: National Firefighter Questionnaire/Disability</b> |                               |          |
|--|-------------------------------|----------|
| <b>Disability</b>  | <b>Number of Participants</b> | <b>%</b> |
| Yes  | 1                             | 1.1      |
| No   | 91                            | 98.9     |
| Undeclared   | 1                             |          |
| <b>Total</b>   | <b>93</b>                     |          |

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