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13 October 2001

Carl D. Reams
Managing Director
PaQS People and Quality Solutions Pty Ltd
PO Box 176
Uki, NSW 2484

Dear Carl,

Re: Independent Accident Risk Management (ARM) Analysis and Validation Opinion

Having categorised and analysed in great detail all ARM relevant material provided by NCS/London House and PaQS (67 psychometric studies) we offer the following summaries on our empirical findings.

ARM Safety Assessment

The Accident Risk Management (ARM) questionnaire and profile were designed to measure awareness of safety attitudes towards safety practices. Known in the USA as the *Employee Safety Inventory (ESI-Q)*, this questionnaire yields 8 scales:

- | | |
|--|--|
| 1) Safety Control (locus of control) | 2) Risk Avoidance |
| 3) Stress Tolerance | 4) Driver Attitudes |
| 5) Quality Orientation | 6) Safety Index (composite of first three scales) |
| 7) Accuracy (validity check - reading comprehension) | 8) Distortion (validity check - defensive self-report) |

The various research studies show that the first three scales are quite strongly correlated with one another which justifies the use of the overall Safety Index.

The first three scales are also to be found in several other NCS/London House questionnaires such as the *Personnel Selection Inventory*. Our analysis of ARM studies takes these other questionnaires into account.

**Criterion-related Validity**

We are able to comment on the impressive efforts and volume of empirical data produced by NCS/London House in North America to support the ARM. In addition, PaQS may be commended for investigating the empirical validity of ARM on Australian samples. We can confirm that in excess of 30,000 ARM assessments have been completed in Australia between 1994 and 2000 and that the latest validity review was conducted in September 1998 involving nearly 5,000 cases.

The vast majority of these studies, both American and Australian, address the all-important issue of the extent to which the ARM questionnaire is capable of predicting work behaviours and attitudes, i.e. its degree of criterion-related validity.

Both NCS/London House and PaQS have produced tangible evidence that the ARM is capable of identifying individuals who are at risk of having accidents across a number of industries including manufacturing, transportation, dairy farming, publishing, retail, hotel, protective services, and (in Australia) mining. Most of the studies were conducted during the late 1980s and early 1990s but there have been a few more recent studies as well. All seven Australian studies are post-1992.

The criterion used most frequently in these studies is the number and/or severity of accidents and injuries sustained in the workplace. In addition, several studies also demonstrate the cost benefits of using ARM, e.g., in terms of savings on worker compensation claims. These are 'hard, bottom-line' criteria and are preferable to the 'softer, more subjective' kind of criteria usually employed in validation studies such as supervisor ratings of worker performance and/or attitude toward workplace safety. Furthermore, the various studies conducted before and after safety training are suggestive that the qualities assessed by ARM are trainable.

Our judgement is that the validity coefficients for the summary Safety Index scale are similar in magnitude to validity coefficients for robust aptitude, vocational interest, and other psychometric tests. This suggests that the predictive or 'diagnostic' efficiency of ARM meets acceptable professional standards.

Fairness (Equal Opportunity)

These studies provide evidence that the ARM does not discriminate unfairly on grounds of gender, age, or (in North America) race.

Reliability

Two studies have been reported concerning the reliability (level of accuracy of measurement) of ARM scales. The reliability coefficients that have been reported meet professionally acceptable standards. We recommend that more studies of the questionnaire's reliability on a wider cross-section of the target population be conducted.

As per request, we are available to discuss the finer and critical points of our statistical analysis with your associates, clients and other individuals or organisations you may nominate.

Yours sincerely,

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