

**Metrics@Work Inc.**  
**In Association with Brock University,**  
**Workplace Health Research Laboratory**  
**(WHRL)**

**EFS Survey Validation: Psychometric Quality**  
**Standards**

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## Background of the EFS Survey tool:

The ©Employee Feedback System (©EFS) Survey tool was initially developed by the Institute for the Improvement of Quality Practices, University of Waterloo, who was contracted in 1998, by the National Quality Institute (NQi).

The EFS was constructed with four major goals in mind (NQi, 2000).

1. First, it was to be based on sound and empirically tested theories of employee satisfaction.
2. Second, it was to be designed in such a way as to balance the needs of scientific rigor (including high reliability and validity of the scales), with the practical aspects of being useful to work organizations.
3. Third, it was designed to be a generic measure that could be used with a wide variety of industries, across job levels and job functions.
4. The fourth goal was to capture a wide range of employee satisfaction facets and provide attitudinal scales to measure employee attitudes related to the practice of Quality in the workplace.

## Measuring Quality

One of the unique attributes of the Employee Feedback System Survey was the original inclusion of three scales that measured employee perception and attitudes toward the principles of Quality. Pioneers of the quality movement including Dr. W.E. Deming, whose teachings have had a considerable impact on the way many organizations operate, have established these principles.

To develop the three Quality scales in the EFS Survey, the National Quality Institute's *Canadian Quality Criteria* was used as a guideline for developing items to measure these criteria. These guidelines are consistent with internationally recognized Principles of Quality including:

- Co-operation, teamwork and partnering
- Leadership through involvement and by example
- Primary focus on customers
- Respect for the individual and encouragement for people to develop their full potential
- Contribution of each and every individual
- A process-oriented and prevention-based strategy
- Continuous improvement of methods and outcomes
- Factual approach to decision-making
- Obligations to stakeholders, including an exemplary concern for responsibility to society.

The mapping back of the Employee Feedback System Survey to the Quality Principles and the Canadian Quality Criteria ensured that the EFS could be used as a suitable tool following the application of the NQi's Quality Fitness Test or other self-assessment tools.

The Employee Feedback System Survey was also considered a crucial tool for the implementation of the National Quality Institute's "Canadian Healthy Workplace Criteria," because it ensured that the employees' voice is heard as part of a comprehensive approach to managing a healthy workplace.

**The Original University of Waterloo,  
Institute for the Improvement of Quality Practices Validation and Reliability  
Study (1998)**

### **EFS Survey Methodology**

In order to establish the reliability and validity of the scales of the initial Employee Feedback System Survey, the University of Waterloo, Institute for the Improvement of Quality Practices involved four widely different companies by including an engineering, aerospace, IT and a service organization in the original validation study. A total of 314 employees, managers, and executives completed the survey. In addition, 136 of these participants also completed the Job Descriptive Index (JDI). The JDI has been used in organizational research for over 30 years and was well documented as a valid measure of employee satisfaction.

### **EFS Survey Validation**

The initial EFS Survey consisted 161 items representing 13 scales. The second version (1.0b) consisted of 140 items representing 15 scales. This evolution was the result of analyses to determine whether each scale was:

1. uni-dimensional (i.e., it measured one identifiable construct or idea)
2. optimal in terms of reliability, but
3. optimized in terms of variation (i.e., items with low variation were omitted).

Concurrent validity (a form of Criterion validity) was established by demonstrating significant correlations between scales on the EFS Survey and the corresponding scales on the JDI. For example, a strong positive correlation was found between the JDI scale for Supervision and the EFS sub-scale Satisfaction with Supervisor.

In addition the content validity of each scale was determined by the expertise of the University of Waterloo, Institute for the Improvement of Quality Practices.

### **EFS Survey Reliability**

The NQI Employee Feedback System Survey scales demonstrated superior to good internal consistency across all four organizations in the original validation study. The scales all recorded internal consistencies of greater than 0.80 (Cronbach's Alpha statistic was used). Therefore, in the original validation study all 15 scales clearly exceeded the generally accepted reliability standard of 0.70 (see, for example, Nunnally and Bernstein, 1994).

**Brock University, Workplace Health Research Unit (WHRL)  
Validation and Reliability Studies (2000 – 2003)**

Brock University, WHRL, in 1999, developed a business and research partnership with NQI to further develop the EFS Survey, create a reporting system for client organizations, administer the EFS, and create a benchmark database.

The following development activities were carried out from 2000 to 2002:

1. Additional “core” EFS scales were added from a variety of sources
2. Negatively worded items were dropped or modified to positive statements (this was done mainly due to factor breakdown occurring between negatively worded and positively worded items)
3. Some subtle wording changes were made to create simpler or clearer wording
4. An additional item was added to every scale, most commonly using the introductory phrase, “Overall, I am satisfied with .....
5. Additional demographic variables were included (e.g., shiftwork and education level)
6. A measurement of each EFS Scales “Importance to Quality of Worklife” was included in the survey
7. An “Open-ended” response category was added for each Quality of Worklife area
8. The entire EFS Survey was re-translated to French (the original EFS was created in a parallel French form) and the new translation was validated with a variety of French-Canadian Human Resources staff in a variety of organizations
9. A scannable form of the EFS Survey was created
10. A web-format of the EFS Survey was created
11. A series of “short form” EFS Surveys were created

When used in some projects, in a few instances, some of the originally validated scales broke down into separate scales. For example, recognition and reward items split between individual and team factors when they were factor tested. Where this occurred separate scales were created. In each project, the internal consistencies and factor checks were maintained to quality assure scales were loading on one factor and exceeding 0.70 using the Cronbach Alpha statistic (see also the Reliability section later in this report).

By 2001, 24 “core scales” were in use, all positively worded, all repeatedly demonstrating a single factor structure, and all but one scale consistently exceeding 0.70 using the Cronbach Alpha statistic.

The sole exception in the consistency measurement was for the turnover intentions scale, which frequently had an Alpha statistic scoring in the 0.60's. To counter this lower consistency, three forms of commitment were introduced: normative, affective and continuous commitment as they are considered in the organizational

literature to be antecedents to turnover intentions. These three commitment measures were later reduced to two (affective and normative) due to inconsistent factor loading of the items on the continuous commitment scale and its confounding with the other two scales.

## **Face Validity**

The following examples demonstrate the face validity of the EFS scales using academic and professional communities:

1. The original 15 scales were developed by a group of university experts, who would be considered subject matter experts, from the University of Waterloo, Institute for the Improvement of Quality Practices
2. The adapted scales were developed at Brock University, Workplace Health Research Unit by researchers with graduate degrees in organizational psychology, sociology, statistics, and health promotion and who would be considered subject matter experts
3. Several added scales were derived from public peer reviewed academic publications (e.g., commitment scales developed by Michael Clugston, Jon P. Howell and Peter W. Dorfman, 2000)
4. At least three thousand managers and senior executives have completed the survey and used the survey reports and there has been no single instance where they have questioned the meaning of the original scales in terms of what they are measuring

## **Content Validity**

Content validation was part of the original validation project carried out by the University of Waterloo, Institute for the Improvement of Quality Practices.

However, as an additional quality assurance step and to improve content validation, in 2001, for each scale an “Overall” item was included within each scale. Brock University, WHRL did this to improve confidence that each EFS scale was capturing the totality of the original construct. As Neuman (2000) explains the constructs being measured should be represented by items that capture, “all the ideas or areas in the conceptual space” (p. 168) of the construct. The “Overall” statement for each scale is expected, in a general way, to capture any “content” of the original construct that was not covered by the specific scale items.

Each “Overall” item was tested with all the items in each scale and:

1. in all cases the new scale met the reliability and validity criteria as outlined above.
2. in no single case was the reliability of the scale decreased by the inclusion of the “Overall item”
3. in 22 of the 23 scales the reliability was increased
4. in one scale the reliability stayed the same

5. each of the “Overall” items was found to have a mean that was within the range of the construct means when just the original items are used
6. in all but one scale (a commitment scale) the “Overall” item mean was adjacent to the original scale’s mean
7. in all but one scale (a commitment scale) the “Overall” item was correlated between 0.8 and 0.9 with the construct means when just the original items were used - the overall commitment scale item correlated 0.64 but was retained to be consistent across all EFS scales

The above 7 findings are psychometric indicators that the “Overall” single items are capturing the original construct’s content (e.g., are highly related to the other scale items’ and to the original scales’ means). In addition, in almost all cases (22 of the possible 23) the reliability of the scale was improved (we recognize this is partly a function of the number of items increasing). Finally, the means of the added items were within the original ranges of the original items means and are, therefore, considered to have enhanced the content validity of the scales.

**Brock University, Workplace Health Research Unit (WHRL)  
Validation and Reliability Studies 2003 – 2007)**

In 2003, Brock University, WHRL became the sole owner of the EFS tool, reporting systems, and database. In 2003, one “core scale” was removed. It was an original scale that measured a respondent’s assessment of his/her behaviours about continuously improving the Quality of their Job or Achieving Excellence - Individual Level. It became clear that this scale was consistently the highest rated scale among all the EFS scales and that the response to the items was within a very restricted part of the 7 point likert scale (indicated by a high mean and low standard deviation). Essentially everyone checked only agree and strongly agree.

The EFS Survey (v.9.1), therefore, included 118 items grouped in 23 scales.

|   |                                   |
|---|-----------------------------------|
| Organizational Satisfaction                 | Co-worker Cohesion                |
| Job Satisfaction                            | Resources and Supplies            |
| Satisfaction with Supervisor                | Inter-Unit Cooperation            |
| Pay Satisfaction                            | Continuous Quality Improvement    |
| Benefits Satisfaction                       | Training Satisfaction             |
| Satisfaction with Physical Work Environment | Strategic Leadership              |
| Workload                                    | Team Recognition and Reward       |
| Impact of Job on Personal Life              | Individual Recognition and Reward |
| Job Control                                 | Intentions to Remain              |
| Job Clarity                                 | Personal Involvement              |
| Employee Involvement                        | Loyalty                           |
| Communication                               |                                   |

## Criterion Validity

**Concurrent validity** (a form of Criterion validity) was established, during the original work done by the University of Waterloo, Institute for the Improvement of Quality Practices, by demonstrating significant correlations between 6 scales on the EFS Survey and the corresponding scales on the Job Descriptive Index (JDI). The JDI has been in use in organizational psychology for well over 30 years and would be considered to be a well recognized and accepted measure. The 6 scales against which the EFS Survey was compared, with the correlation coefficient in parentheses, were:

1. Job Satisfaction ( $r=.82$ )
2. Organizational Satisfaction ( $r=.71$ )
3. Supervisor Satisfaction ( $r=.86$ )
4. Pay Satisfaction ( $r=.47$ )
5. Co-worker Cohesion ( $r=.63$ )
6. Recognition and Reward ( $r=.65$ )

Therefore, five of these correlation coefficients can be considered to be “good” evidence of concurrent validity as the correlation coefficients exceed 0.60 (Innes & Straker, 2003), whereas the Pay Satisfaction scale correlation coefficient, i.e.,  $r>0.40$  would be considered moderate evidence of concurrent validity.

**Predictive validity** (another form of Criterion validity). In the purest sense of the term “prediction” relies on establishing that a previous measurement has a demonstrated relationship with a later related measurement, typically some behaviour or outcome.

The EFS Survey has a number of measurements, such as organizational satisfaction, job satisfaction, supervisor satisfaction and intentions to remain, that could be considered to represent “outcomes”. At the same time many of the other EFS Survey scales would be considered to be antecedents to those outcomes. For instance, one would expect an assessment of a supervisor to be based on factors that the supervisor has a strong influence over such as job clarity, recognition and reward. Similarly one would expect job satisfaction assessments to be based on factors such as job stressors and communication.

Therefore, we have carried out multiple tests (simple correlations as well as more sophisticated multiple regression analyses) and found strong evidence of predictive validity between what would be considered antecedent or predictive EFS scales and the EFS outcome scales. In order to simply present a predictive relationship among our scales, we present the highest and lowest inter-correlations from EFS Survey scales collected at the same time. We are aware that this is not a pure form of predictive validity. However, many organizational psychology models and studies are based on such antecedent/predictive relationships, which frequently draw on measures collected from the same survey process.



There have been some remarkable demonstrations of shifts in EFS scales scores that have been associated after the surveying, by company officials, with particular changes in work environments between surveys, i.e., between Time 1 and Time 2. While, in WHRL's experience changes in EFS scale scores across an entire organization are hard to effect, there can be dramatic differences on scale scores for smaller work units. The following case study provides one example, using retrospective evidence, of such "predicted" changes.

Example Case Study: In one EFS Survey client, in between Time 1 and Time 2, a large proportion of workers became unionized and consequently all jobs were required to have job descriptions. Previously few of the unionized jobs had been defined by standardized descriptions. Each staff member at the organization was engaged, as part of the job description exercise, to write an outline of what his or her job was composed. After these descriptions went through some further organizational vetting, including further discussions with the job incumbents, the job description was then reviewed with each staff member and finalized. At Time 1, Job Clarity was measured at 63.7% and after the job description exercise, i.e., at Time 2, Job Clarity was measured at 75.6%.

### **Reliability of Constructs**

**Stability reliability** (sometimes called test-retest reliability) is the agreement of measuring instruments over time: To determine stability, a measure or test is repeated on the same subjects at a future date, usually within a short period of time in order to reduce the likelihood for maturation or external factors changing the scores. We currently do not have a direct measurement of such reliability for the EFS Survey scales.

However, the EFS Survey has a respondent created code that allows WHRL to track results from one test time to another while retaining the respondent's anonymity. We have used those codes to provide an approximation of test-retest reliability using data collected from the same respondents in 5 companies who have conducted EFS Surveys, one year apart. Across an entire organization one would not expect the survey results to move dramatically up or down. However, with systematic effort directed toward QWL improvement one would expect to see the results improve over time.

In Figure 1 below we show the differences between the same respondents in the two surveys using aggregated measures across all 5 companies (the difference scores were calculated for each scale by subtracting the Time 1 measure from Time 2, i.e., change scores, the upper two lines). As can be seen from Figure 1 there are no large negative or positive deviations (i.e., the lower line), which is an approximate indicator of test-retest reliability.

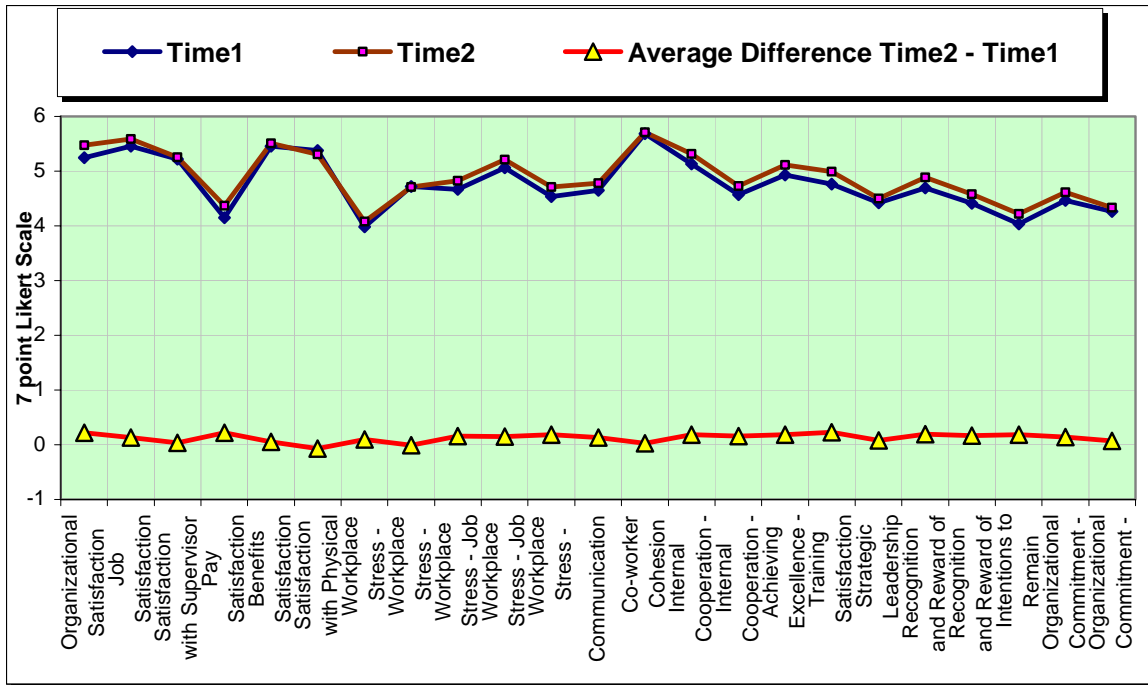


Figure 1: Stability over time reliability

Further we have displayed two of those companies' results. In Company one the company officials indicated to WHRL that there was a consistent effort through a series of Organizational Development interventions to make Quality of Work Life changes. In comparison, in Company two there was no real effort to make such changes.

As can be seen in Figure 2 (see below) in the Company one there was a consistent improvement from Time 1 to Time 2. This can be seen by the fact that every single EFS Survey scale had a positive change score at Time 2. In direct contrast to that result, in the second company, the change scores generally stayed the same or dropped (i.e., had negative changes scores). In some instances, in Company 2 there was a marked drop in scores from Time 1 to Time occurred whereas in Company 1 there was no such drop. This, again, is evidence of the EFS Survey reliably reflecting expected quality of worklife changes based on known efforts to improve quality of worklife (i.e., a kind of tool responsiveness reliability).

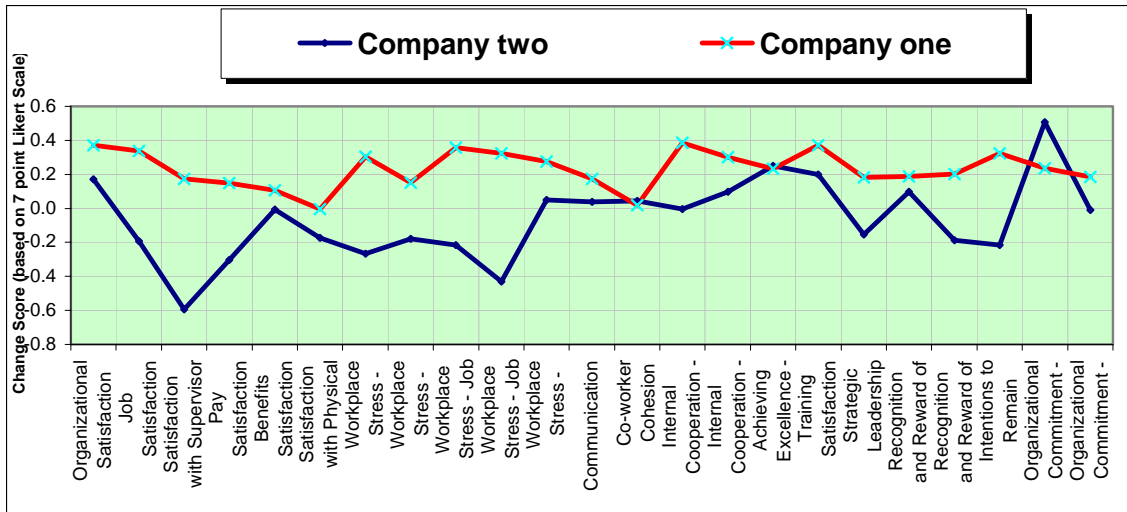


Figure 2: Change measurement reliability (Responsiveness)

**Internal consistency.** The Cronbach Alpha statistic measures the relationships among the items in a scale and is based on the average inter-item correlation (SPSS, 1999) and is considered to be one of the most widely used reliability coefficients. Each item is measured in term of how strongly it correlates with the rest of the scale (e.g., by the item to total scale correlation) and whether the internal consistency would improve if the item were removed. These tests are based on the fact that each item in a scale should be highly correlated with the underlying construct the scale is supposed to be measuring.

As has been outlined earlier in the document, Metrics@Work Inc. has set a quality assurance standard of each EFS Survey scale having an internal consistency rating of at least 0.7 using the Cronbach Alpha statistic for each EFS project. In Table 2 we present the Alpha coefficients for all 27 core EFS Survey scales. They range from 0.87 to a high of .95 indicating very high internal consistency of the items. In Table 3 we present the stability of those coefficients across different demographic groups. All these results indicate strong, consistently high, and stable internal consistency.

**Across Form Consistency (this is based on web versus paper and pencil forms of the EFS).** An optimal across-form reliability test would be to have data from the same persons based on their completion of both forms of testing, i.e., web and paper and pencil forms. Ideally, the correlations of the items and scales would be very high, i.e., indicating that the respondent provided the same answers for each item no matter which format was used.

Metrics@Work Inc. has, to date, not conducted such an across-form consistency test. However, in an approximation of such a test, WHRL has compared earlier on 2005 the responses of respondents from the same companies where a paper and pencil format as well as a web-based form was provided for respondents to choose from. The samples are not closely matched. For instance, those who have access

to computers tend to be more highly educated and work in a supervisor or management position. However, in an attempt to approximate the across-form comparison we have computed a correlation coefficient by comparing the means obtained from each form (i.e., paper and pencil and web based), on each EFS Survey scale, from each company where both forms were made available. The correlation coefficient where both forms were administered was  $r=.91$ . While this is not a proper test of across form consistency and despite samples not being closely matched this high coefficient indicates that at the aggregated organizational level the ratings were very similar, which we present as an approximation of across form consistency.

### **Ongoing Validity and Reliability Processes**

As a part of quality assurance to clients, and to ensure that original, modified, or added scales meet an acceptable level of validity and reliability, for every additional project, all EFS scales are subject to ongoing internal consistency analyses. This is carried out, at a minimum:

- by testing for item internal consistency using the Cronbach Alpha and
- each scale is tested for factor validity by running an exploratory factor analysis on each scale to test that
  - all items load on one factor and
  - that a reasonable amount of variance is captured by the complete scale.

### **Metrics@Work Inc. (2007 – Ongoing Validation)**

In 2007 the newly incorporated consulting firm Metrics@Work inc. in partnership with Brock University took over ownership and further development of the EFS tool and database as well as the reporting system. Previous WHRL Staff and Brock University now own Metrics@Work Inc. Metrics@Work operates according to all guidelines, processes and systems previously approved by Brock University's Research Ethics Board.

To date, the EFS Survey tool has been used in over 244 survey projects and, depending on the EFS Survey scale being measured, there are collective employee responses ranging from a low of 20,000 to a high of over 118,000 for each EFS Survey scale, representing a population of 216,000 employees.

#### **The following development activities were carried out from 2007 to 2009:**

- 1 Additional "core" EFS scales were added from a variety of sources:
  - Employment relationship scale, measuring trust, fairness and respect, taken from the CPRN-Ekos changing Employment Relationships Survey: A public domain research of the CPRN Work network directed by Graham Lowe (Lowe & Schellenberg, 2001)
  - Work engagement scale, reflecting a short form of Schaufeli's Job Engagement scale (Schaufeli, 2002)
  - Career Development Opportunities, measuring satisfaction with professional progress opportunities
- 2 Communication Scale was split into two scales reflecting the organizational and the local (or area) communication.
- 3 Adding new section to measure Frequency and Reporting of Negative Workplace Behaviours by several perpetrators (Coworkers, People in Authority, Clients, or Clients Families):
  - Psychological Negative Acts
  - Discriminatory or Coded Negative Acts
  - Violent (including Sexual) Negative Acts
- 4 Adding Self reported individual Performance and individual health measures

The most recent version of the core EFS Survey (v.10), not including additions 3 and 4 above, contains 138 items grouped in 27 scales, and 27 importance single items.

|                              |                                  |
|------------------------------|----------------------------------|
| Organizational Satisfaction  | Co-worker Cohesion               |
| Job Satisfaction             | Resources and Supplies           |
| Work Engagement              | Inter-Unit Cooperation           |
| Satisfaction with Supervisor | Continuous Quality Improvement   |
| Pay Satisfaction             | Training Satisfaction            |
| Benefits Satisfaction        | Career Development Opportunities |
|                              | Strategic Leadership             |

|   |                                   |
|---|-----------------------------------|
| Satisfaction with Physical Work Environment | Team Recognition and Reward       |
| Workload                                    | Individual Recognition and Reward |
| Impact of Job on Personal Life              | Employment Relationships          |
| Job Control                                 | Intentions to Remain              |
| Job Clarity                                 | Personal Involvement              |
| Employee Involvement                        | Loyalty                           |
| Organizational Communication                |                                   |
| Local Work area Communication               |                                   |

In addition to the above changes a single Item Pulse EFS Survey was created based on each of the scale areas within the EFS. As well, multiple custom modules have been developed and can be added to the core EFS (e.g., Leadership Competency, Performance Management, Alignment with Strategic Plan or Mission , Vision, and Values)

### **Updated Validity Testing Information (2007 – Ongoing)**

In the current EFS Survey (v.10) there are 27 core scales. Therefore, among those 27 scales there are 351 possible inter-correlations. For the sake of brevity we show the very highest inter-correlations and the very lowest inter-correlations (**see Appendix: Table 1A and Table 1B**).

Example Outcome Relationship with EFS Survey scales: As can be seen in Table 1A, from among the highest correlations Organizational Satisfaction, an “outcome” variable, is inter-correlated strongly ( $r > 0.5$ ) with 10 of the EFS core scales. Whereas, as can be seen in **Table 1B**, Organizational Satisfaction is not among any of the lowest inter-correlations ( $r < 0.2$ ).

### **Updated Construct Validity**

**Convergent Validity** (a form of construct validity) occurs when multiple indicators converge or can be shown to be highly associated with each other. For instance, one would expect “Communication” to be highly related to “Employee Involvement” ( $r = .74$ ), “Individual Recognition and Reward” ( $r = .64$ ), and “Continuous Quality Improvement” ( $r = .68$ ). Another example would be that one would expect “Intention to Remain” to be highly related to the two EFS Survey commitment scales “Personal Involvement” ( $r = .58$ ) and “Loyalty” ( $r = .60$ ) as well as “Organizational Satisfaction” ( $r = .59$ ). As the correlation coefficients in the parentheses demonstrate, indeed, those scales are strongly correlated to constructs that one would expect them to be correlated with, which are evidence, therefore, of convergent validity.

***Discriminant Validity*** (a form of construct validity, also known as divergent validity) occurs when multiple indicators do not converge (i.e., diverge) or can be shown to be less associated with each other. For instance, one would expect “Co-worker Cohesion” to be lowly related to “Pay Satisfaction” ( $r=.19$ ), “Benefits Satisfaction” ( $r=.20$ ), and “Impact of Job on Personal Life” ( $r=.23$ ). Another example would be that one would expect “Pay Satisfaction” to be lowly related to “Impact of Job on Personal Life” ( $r=.29$ ), “Co-worker Cohesion” ( $r=.19$ ), and “Resources and Supplies” ( $r=.3$ ). As the correlation coefficients in the parentheses demonstrate, indeed, those scales are less strongly correlated to constructs that one would expect them to be less correlated with, which are evidence, therefore, of discriminant validity.

### **Updated External Validity**

External validity is most commonly associated with experimental research (i.e., not survey research) where one is concerned that findings about causal relationships with one group of subjects are generalizable to other groups of subjects, in different situations or places and times (Cook and Campbell, 1979; Neuman, 2000). However, external validity is considered more important in applied research than theoretical research (Cook and Campbell, 1979). Despite external validity being most closely associated with experimental research, we feel external validity has relevance to survey research in as much as one would expect the EFS Survey scales to be valid and reliable measures across different economic sectors, demographic factors and work functions.

The EFS Survey has been used in over 244 projects, to date, represented by diverse types of organizations in sectors such as finance, health, manufacturing, education, government (federal, provincial, regional and municipal) and industrial. As a simple representation of the stability of the measures across those diverse groups of respondents the Cronbach Alpha coefficients and the Factor loadings of the items for each scale are consistently strong (***See Appendix: Table 2***).

As noted previously, as a part of Metrics@Work Inc.’s quality assurance processes these measurements are checked on the data collected during each project and using the previously discussed measurement criteria, the reliability and factor structures have been found to be invariant across economic sectors and individual organizations.

As well, the EFS Survey has been completed by a large diversity of employees in terms of demographic, or work, factors such as:

- job types,
- work area function,
- unionized or not,
- shift work or not,
- job tenure
- gender

- age

We reproduce a table of Cronbach Alpha statistics for all the EFS Survey scales which have been created using some of the demographic breakdowns shown immediately above (**See Appendix: Table 3**). Those results indicate that across those groupings the reliability of the EFS Survey scales stay uniformly very high suggesting that the reliability across different groups of respondents is stable.

### **Updated Factor Loadings based on EFS contains 138 items best fitting to 27 scales.**

In an approximation of a Confirmatory Factor Analysis, an Explanatory, Principal Component Factor Analysis with an imposed 27-factor solution was carried out on the entire EFS data set. The analysis yielded the following findings of the 27-factor solution (**See Appendix: Table 2**):

1. The cumulative amount of observed variable variance explained by adding all factors together is 79.4%.
2. Of the total variance of each factor's items the variance explained in each factor ranged from a low of 64% to a high of 90%
3. Each item from a particular EFS Survey scale correlates more highly with that scale (corrected for part-whole dependency) than with any other EFS Survey scale
4. Each item from a particular EFS Survey scale correlates more highly with that scale (corrected for part-whole dependency) than does any other item not in that scale

**Internal consistency.** The Cronbach Alpha statistic measures the relationships among the items in a scale and is based on the average inter-item correlation (SPSS, 1999) and is considered to be one of the most widely used reliability coefficients. Each item is measured in term of how strongly it correlates with the rest of the scale (e.g., by the item to total scale correlation) and whether the internal consistency would improve if the item were removed. These tests are based on the fact that each item in a scale should be highly correlated with the underlying construct the scale is supposed to be measuring.

As has been outlined earlier in the document, Metrics@Work Inc. has set a quality assurance standard of each EFS Survey scale having an internal consistency rating of at least 0.7 using the Cronbach Alpha statistic for each EFS project. In Table 2 we present the Alpha coefficients for all 27 core EFS Survey scales. They range from 0.87 to a high of .95 indicating very high internal consistency of the items. In Table 3 we present the stability of those coefficients across different demographic groups. All these results indicate strong, consistently high, and stable internal consistency.



**Across Form Consistency (this is based on web versus paper and pencil forms of the EFS).** An optimal across-form reliability test would be to have data from the same persons based on their completion of both forms of testing, i.e., web and paper and pencil forms. Ideally, the correlations of the items and scales would be very high, i.e., indicating that the respondent provided the same answers for each item no matter which format was used.

Metrics@Work Inc. has, to date, not conducted such an across-form consistency test. However, in an approximation of such a test, Metrics@Work has compared the responses of respondents from the same companies where a paper and pencil format as well as a web-based form was provided for respondents to choose from. The samples are not closely matched. For instance, those who have access to computers tend to be more highly educated and work in a supervisor or management position. However, in an attempt to approximate the across-form comparison we have computed Crombach Alpha coefficient, on each EFS Survey scale, from each Survey format where both forms were made available. As can be seen in **Table 3** the coefficients where both forms were administered were very close. While this is not a proper test of across form consistency and despite samples not being closely matched this high coefficient indicates that at the aggregated organizational level the ratings were very similar, which we present as an approximation of across form consistency.

### Ongoing Validity and Reliability Processes

As a part of quality assurance to clients, and to ensure that original, modified, or added scales meet an acceptable level of validity and reliability, for every additional project, all EFS scales are subject to ongoing internal consistency analyses. This is carried out, at a minimum:

- by testing for item internal consistency using the Cronbach Alpha and
- each scale is tested for factor validity by running an exploratory factor analysis on each scale to test that
  - all items load on one factor and
  - that a reasonable amount of variance is captured by the complete scale.

| Scales                                      | Crombach Alpha | Variation Explained | N       |
|---|----------------|---------------------|---------|
| Organizational Satisfaction                 | 0.949          | 80%                 | 102,939 |
| Job Satisfaction                            | 0.912          | 79%                 | 97,076  |
| Satisfaction with Supervisor                | 0.955          | 79%                 | 100,537 |
| Pay Satisfaction                            | 0.953          | 88%                 | 62,336  |
| Benefits Satisfaction                       | 0.916          | 64%                 | 60,428  |
| Satisfaction with Physical Work Environment | 0.879          | 68%                 | 93,564  |
| Workload                                    | 0.94           | 81%                 | 100,523 |
| Impact of Job on Personal Life              | 0.94           | 85%                 | 101,915 |
| Job Control                                 | 0.922          | 81%                 | 89,777  |
| Job Clarity                                 | 0.894          | 78%                 | 100,589 |

|  |              |            |                |
|--|--------------|------------|----------------|
| <b>Employee Involvement</b>              | <b>0.89</b>  | <b>75%</b> | <b>99,008</b>  |
| <b>Org. Communication</b>                | <b>0.926</b> | <b>73%</b> | <b>101,166</b> |
| <b>Local Communication</b>               | <b>0.947</b> | <b>90%</b> | <b>56,589</b>  |
| <b>Co-worker Cohesion</b>                | <b>0.931</b> | <b>79%</b> | <b>101,438</b> |
| <b>Resources and Supplies</b>            | <b>0.937</b> | <b>76%</b> | <b>97,008</b>  |
| <b>Inter-Unit Cooperation</b>            | <b>0.931</b> | <b>88%</b> | <b>94,674</b>  |
| <b>Continuous Quality Improvement</b>    | <b>0.908</b> | <b>69%</b> | <b>90,065</b>  |
| <b>Training Satisfaction</b>             | <b>0.959</b> | <b>83%</b> | <b>91,381</b>  |
| <b>Strategic Leadership</b>              | <b>0.96</b>  | <b>83%</b> | <b>98,672</b>  |
| <b>Team Recognition and Reward</b>       | <b>0.907</b> | <b>73%</b> | <b>94,602</b>  |
| <b>Individual Recognition and Reward</b> | <b>0.909</b> | <b>74%</b> | <b>99,830</b>  |
| <b>Intentions to Remain</b>              | <b>0.928</b> | <b>82%</b> | <b>79,865</b>  |
| <b>Personal Involvement</b>              | <b>0.926</b> | <b>74%</b> | <b>80,301</b>  |
| <b>Loyalty</b>                           | <b>0.915</b> | <b>75%</b> | <b>40,695</b>  |
| <b>Career Development Opportunities</b>  | <b>0.92</b>  | <b>86%</b> | <b>49,793</b>  |
| <b>Employment Relationships</b>          | <b>0.908</b> | <b>73%</b> | <b>57,642</b>  |
| <b>Job Engagement</b>                    | <b>0.922</b> | <b>81%</b> | <b>25,979</b>  |

**References:**

Are available on request from [Metrics@Work](#) Inc.

## APPENDIX

**TABLE 1A**  
**HIGHEST EFS SCALES INTER-CORRELATIONS (T1)**

| <u>EFS Scale 1</u>                | <u>Pearson</u> | <u>EFS Scale 2</u>                |
|-----------------------------------|----------------|-----------------------------------|
| Job Engagement                    | <b>0.748</b>   | Job Satisfaction                  |
| Individual Recognition and Reward | <b>0.746</b>   | Team Recognition and Reward       |
| Org. Communication                | <b>0.742</b>   | Employee Involvement              |
| Strategic Leadership              | <b>0.714</b>   | Org. Communication                |
| Strategic Leadership              | <b>0.713</b>   | Continuous Quality Improvement    |
| Continuous Quality Improvement    | <b>0.684</b>   | Organizational Satisfaction       |
| Continuous Quality Improvement    | <b>0.677</b>   | Org. Communication                |
| Strategic Leadership              | <b>0.675</b>   | Organizational Satisfaction       |
| Strategic Leadership              | <b>0.661</b>   | Employee Involvement              |
| Individual Recognition and Reward | <b>0.649</b>   | Employee Involvement              |
| Continuous Quality Improvement    | <b>0.648</b>   | Employee Involvement              |
| Individual Recognition and Reward | <b>0.636</b>   | Org. Communication                |
| Local Communication               | <b>0.636</b>   | Org. Communication                |
| Personal Involvement              | <b>0.634</b>   | Organizational Satisfaction       |
| Org. Communication                | <b>0.631</b>   | Organizational Satisfaction       |
| Individual Recognition and Reward | <b>0.63</b>    | Continuous Quality Improvement    |
| Impact of Job on Personal Life    | <b>0.628</b>   | Workload                          |
| Individual Recognition and Reward | <b>0.627</b>   | Strategic Leadership              |
| Individual Recognition and Reward | <b>0.623</b>   | Organizational Satisfaction       |
| Employee Involvement              | <b>0.62</b>    | Organizational Satisfaction       |
| Team Recognition and Reward       | <b>0.611</b>   | Employee Involvement              |
| Team Recognition and Reward       | <b>0.604</b>   | Org. Communication                |
| Loyalty                           | <b>0.603</b>   | Intentions to Remain              |
| Career Development Opportunities  | <b>0.602</b>   | Individual Recognition and Reward |
| Team Recognition and Reward       | <b>0.601</b>   | Continuous Quality Improvement    |
| Team Recognition and Reward       | <b>0.597</b>   | Strategic Leadership              |
| Intentions to Remain              | <b>0.593</b>   | Organizational Satisfaction       |
| Individual Recognition and Reward | <b>0.589</b>   | Satisfaction with Supervisor      |
| Team Recognition and Reward       | <b>0.587</b>   | Organizational Satisfaction       |
| Personal Involvement              | <b>0.583</b>   | Intentions to Remain              |

| <u>EFS Scale 1</u>                | <u>Pearson</u> | <u>EFS Scale 2</u>                |
|-----------------------------------|----------------|-----------------------------------|
| Job Engagement                    | <b>0.58</b>    | Personal Involvement              |
| Career Development Opportunities  | <b>0.577</b>   | Training Satisfaction             |
| Local Communication               | <b>0.574</b>   | Employee Involvement              |
| Loyalty                           | <b>0.561</b>   | Personal Involvement              |
| Career Development Opportunities  | <b>0.561</b>   | Organizational Satisfaction       |
| Individual Recognition and Reward | <b>0.557</b>   | Local Communication               |
| Personal Involvement              | <b>0.557</b>   | Individual Recognition and Reward |

**TABLE 1B  
LOWEST EFS SCALES INTER-CORRELATIONS**

| <u>EFS Scale 1</u>             | <u>Pearson</u> | <u>EFS Scale 2</u>                 |
|--------------------------------|----------------|------------------------------------|
| Employment Relationships       | <b>0.252</b>   | Continuous Quality Improvement     |
| Job Clarity                    | <b>0.252</b>   | Pay Satisfaction                   |
| Pay Satisfaction               | <b>0.251</b>   | Job Satisfaction                   |
| Loyalty                        | <b>0.248</b>   | Team Recognition and Reward        |
| Impact of Job on Personal Life | <b>0.247</b>   | Benefits Satisfaction              |
| Employment Relationships       | <b>0.246</b>   | Individual Recognition and Reward  |
| Employment Relationships       | <b>0.245</b>   | Local Communication                |
| Employment Relationships       | <b>0.245</b>   | Strategic Leadership               |
| Benefits Satisfaction          | <b>0.243</b>   | Job Satisfaction                   |
| Loyalty                        | <b>0.236</b>   | Resources and Supplies             |
| Employment Relationships       | <b>0.234</b>   | Org. Communication                 |
| Job Clarity                    | <b>0.233</b>   | Benefits Satisfaction              |
| Loyalty                        | <b>0.233</b>   | Inter-Unit Cooperation             |
| Employment Relationships       | <b>0.231</b>   | Sa. with Physical Work Environment |
| Employment Relationships       | <b>0.23</b>    | Team Recognition and Reward        |
| Co-worker Cohesion             | <b>0.229</b>   | Impact of Job on Personal Life     |
| Employment Relationships       | <b>0.227</b>   | Employee Involvement               |
| Workload                       | <b>0.226</b>   | Benefits Satisfaction              |
| Co-worker Cohesion             | <b>0.213</b>   | Workload                           |
| Loyalty                        | <b>0.211</b>   | Co-worker Cohesion                 |
| Job Control                    | <b>0.206</b>   | Pay Satisfaction                   |
| Employment Relationships       | <b>0.205</b>   | Loyalty                            |
| Co-worker Cohesion             | <b>0.203</b>   | Pay Satisfaction                   |
| Employment Relationships       | <b>0.2</b>     | Satisfaction with Supervisor       |
| Co-worker Cohesion             | <b>0.195</b>   | Benefits Satisfaction              |

| <u>EFS Scale 1</u>       | <u>Pearson</u> | <u>EFS Scale 2</u>             |
|--------------------------|----------------|--------------------------------|
| Loyalty                  | <b>0.188</b>   | Workload                       |
|                          |                | Career Development             |
| Employment Relationships | <b>0.187</b>   | Opportunities                  |
| Employment Relationships | <b>0.178</b>   | Personal Involvement           |
| Employment Relationships | <b>0.162</b>   | Inter-Unit Cooperation         |
| Employment Relationships | <b>0.155</b>   | Co-worker Cohesion             |
| Employment Relationships | <b>0.123</b>   | Pay Satisfaction               |
| Loyalty                  | <b>0.108</b>   | Impact of Job on Personal Life |
| Employment Relationships | <b>0.103</b>   | Benefits Satisfaction          |

**TABLE 2  
EFS SCALES RELIABILITY AND FACTOR LOADINGS**

|                                     | <u>Crom</u>  | <u>Alpha if</u> | <u>Cum. %</u> | <u>Extracti</u> |
|-------------------------------------|--------------|-----------------|---------------|-----------------|
|                                     | <u>b.</u>    | <u>item</u>     | <u>of Var</u> | <u>on</u>       |
|                                     | <u>Alpha</u> | <u>Del.</u>     | <u>Expl.</u>  |                 |
| <b>Organizational Satisfaction</b>  | <b>0.949</b> |                 | <b>80%</b>    |                 |
| 1a                                  |              | 0.94            |               | 82%             |
| 1b                                  |              | 0.944           |               | 76%             |
| 1c                                  |              | 0.946           |               | 74%             |
| 1d                                  |              | 0.938           |               | 81%             |
| 1e                                  |              | 0.938           |               | 81%             |
| 1f                                  |              | 0.932           |               | 89%             |
| <b>Job Satisfaction</b>             | <b>0.912</b> |                 | <b>79%</b>    |                 |
| 2a                                  |              | 0.876           |               | 83%             |
| 2b                                  |              | 0.899           |               | 75%             |
| 2c                                  |              | 0.877           |               | 82%             |
| 2d                                  |              | 0.89            |               | 78%             |
| <b>Satisfaction with Supervisor</b> | <b>0.955</b> |                 | <b>79%</b>    |                 |
| 3a                                  |              | 0.948           |               | 78%             |
| 3b                                  |              | 0.946           |               | 82%             |
| 3c                                  |              | 0.948           |               | 79%             |
| 3d                                  |              | 0.952           |               | 72%             |
| 3e                                  |              | 0.948           |               | 77%             |
| 3f                                  |              | 0.949           |               | 77%             |
| 3g                                  |              | 0.942           |               | 88%             |
| <b>Pay Satisfaction</b>             | <b>0.953</b> |                 | <b>88%</b>    |                 |
| 4a                                  |              | 0.965           |               | 77%             |

|  |              |       |            |
|--|--------------|-------|------------|
|  |              |       | 92         |
|  | <b>4b</b>    | 0.927 | %          |
|  |              |       | 90         |
|  | <b>4c</b>    | 0.934 | %          |
|  |              |       | 92         |
|  | <b>4d</b>    | 0.927 | %          |
| <b>Benefits Satisfaction</b>               | <b>0.916</b> |       | <b>64%</b> |
|  |              |       | 75         |
|  | <b>5a</b>    | 0.898 | %          |
|  |              |       | 42         |
|  | <b>5b</b>    | 0.918 | %          |
|  |              |       | 77         |
|  | <b>5c</b>    | 0.897 | %          |
|  |              |       | 69         |
|  | <b>5d</b>    | 0.902 | %          |
|  |              |       | 61         |
|  | <b>5e</b>    | 0.906 | %          |
|  |              |       | 54         |
|  | <b>5f</b>    | 0.911 | %          |
|  |              |       | 46         |
|  | <b>5g</b>    | 0.915 | %          |
|  |              |       | 87         |
|  | <b>5h</b>    | 0.891 | %          |
| <b>Sat. with Physical Work Environment</b> | <b>0.879</b> |       | <b>68%</b> |
|  |              |       | 61         |
|  | <b>6a</b>    | 0.864 | %          |
|  |              |       | 63         |
|  | <b>6b</b>    | 0.865 | %          |
|  |              |       | 78         |
|  | <b>6c</b>    | 0.834 | %          |
|  |              |       | 54         |
|  | <b>6d</b>    | 0.88  | %          |
|  |              |       | 85         |
|  | <b>6e</b>    | 0.82  | %          |
| <b>Workload</b>                            | <b>0.94</b>  |       | <b>81%</b> |
|  |              |       | 71         |
|  | <b>7a</b>    | 0.94  | %          |
|  |              |       | 81         |
|  | <b>7b</b>    | 0.926 | %          |
|  |              |       | 81         |
|  | <b>7c</b>    | 0.926 | %          |
|  |              |       | 82         |
|  | <b>7d</b>    | 0.924 | %          |
|  |              |       | 88         |
|  | <b>7e</b>    | 0.914 | %          |
| <b>Impact of Job on Personal Life</b>      | <b>0.94</b>  |       | <b>85%</b> |
|  |              |       | 80         |
|  | <b>8a</b>    | 0.935 | %          |



|  |                             |              |  |            |
|--|-----------------------------|--------------|--|------------|
|  | <b>8b</b>                   | 0.923        |  | 84%        |
|  | <b>8c</b>                   | 0.923        |  | 84%        |
|  | <b>8d</b>                   | 0.905        |  | 91%        |
|  | <b>Job Control</b>          | <b>0.922</b> |  | <b>81%</b> |
|  | <b>9a</b>                   | 0.92         |  | 74%        |
|  | <b>9b</b>                   | 0.898        |  | 81%        |
|  | <b>9c</b>                   | 0.897        |  | 82%        |
|  | <b>9d</b>                   | 0.877        |  | 88%        |
|  | <b>Job Clarity</b>          | <b>0.894</b> |  | <b>78%</b> |
|  | <b>10a</b>                  | 0.862        |  | 78%        |
|  | <b>10b</b>                  | 0.918        |  | 62%        |
|  | <b>10c</b>                  | 0.852        |  | 81%        |
|  | <b>10d</b>                  | 0.826        |  | 89%        |
|  | <b>Employee Involvement</b> | <b>0.89</b>  |  | <b>75%</b> |
|  | <b>11a</b>                  | 0.882        |  | 68%        |
|  | <b>11b</b>                  | 0.88         |  | 69%        |
|  | <b>11c</b>                  | 0.849        |  | 79%        |
|  | <b>11d</b>                  | 0.821        |  | 87%        |
|  | <b>Org. Communication</b>   | <b>0.926</b> |  | <b>73%</b> |
|  | <b>12a</b>                  | 0.91         |  | 76%        |
|  | <b>12b</b>                  | 0.906        |  | 79%        |
|  | <b>12c</b>                  | 0.936        |  | 48%        |
|  | <b>12d</b>                  | 0.914        |  | 71%        |
|  | <b>12e</b>                  | 0.908        |  | 78%        |
|  | <b>12f</b>                  | 0.895        |  | 89%        |
|  | <b>Local Communication</b>  | <b>0.947</b> |  | <b>90%</b> |
|  | <b>13a</b>                  | 0.949        |  | 87%        |

|                                       |            |              |  | %          |
|---------------------------------------|------------|--------------|--|------------|
|                                       |            |              |  | 92         |
|                                       | <b>13b</b> | 0.914        |  | %          |
|                                       |            |              |  | 93         |
|                                       | <b>13c</b> | 0.903        |  | %          |
| <b>Co-worker Cohesion</b>             |            | <b>0.931</b> |  | <b>79%</b> |
|                                       |            |              |  | 69         |
|                                       | <b>14a</b> | 0.931        |  | %          |
|                                       |            |              |  | 81         |
|                                       | <b>14b</b> | 0.91         |  | %          |
|                                       |            |              |  | 87         |
|                                       | <b>14c</b> | 0.901        |  | %          |
|                                       |            |              |  | 77         |
|                                       | <b>14d</b> | 0.92         |  | %          |
|                                       |            |              |  | 82         |
|                                       | <b>14e</b> | 0.911        |  | %          |
| <b>Resources and Supplies</b>         |            | <b>0.937</b> |  | <b>76%</b> |
|                                       |            |              |  | 72         |
|                                       | <b>16a</b> | 0.929        |  | %          |
|                                       |            |              |  | 76         |
|                                       | <b>16b</b> | 0.926        |  | %          |
|                                       |            |              |  | 79         |
|                                       | <b>16c</b> | 0.923        |  | %          |
|                                       |            |              |  | 68         |
|                                       | <b>16d</b> | 0.932        |  | %          |
|                                       |            |              |  | 74         |
|                                       | <b>16e</b> | 0.927        |  | %          |
|                                       |            |              |  | 89         |
|                                       | <b>16f</b> | 0.913        |  | %          |
| <b>Inter-Unit Cooperation</b>         |            | <b>0.931</b> |  | <b>88%</b> |
|                                       |            |              |  | 82         |
|                                       | <b>15a</b> | 0.945        |  | %          |
|                                       |            |              |  | 88         |
|                                       | <b>15b</b> | 0.9          |  | %          |
|                                       |            |              |  | 93         |
|                                       | <b>15c</b> | 0.851        |  | %          |
| <b>Continuous Quality Improvement</b> |            | <b>0.908</b> |  | <b>69%</b> |
|                                       |            |              |  | 64         |
|                                       | <b>17a</b> | 0.898        |  | %          |
|                                       |            |              |  | 67         |
|                                       | <b>17b</b> | 0.894        |  | %          |
|                                       |            |              |  | 77         |
|                                       | <b>17c</b> | 0.883        |  | %          |
|                                       |            |              |  | 47         |
|                                       | <b>17d</b> | 0.913        |  | %          |
|                                       |            |              |  | 73         |
|                                       | <b>17e</b> | 0.888        |  | %          |
|                                       |            |              |  | 85         |
|                                       | <b>17f</b> | 0.872        |  | %          |

|  |              |  | %          |
|--|--------------|--|------------|
| <b>Training Satisfaction</b>             | <b>0.959</b> |  | <b>83%</b> |
| 18a                                      | 0.959        |  | 73%        |
| 18b                                      | 0.951        |  | 84%        |
| 18c                                      | 0.95         |  | 85%        |
| 18d                                      | 0.95         |  | 86%        |
| 18e                                      | 0.953        |  | 81%        |
| 18f                                      | 0.945        |  | 91%        |
| <b>Strategic Leadership</b>              | <b>0.96</b>  |  | <b>83%</b> |
| 19a                                      | 0.955        |  | 81%        |
| 19b                                      | 0.95         |  | 87%        |
| 19c                                      | 0.952        |  | 84%        |
| 19d                                      | 0.959        |  | 75%        |
| 19e                                      | 0.953        |  | 83%        |
| 19f                                      | 0.946        |  | 91%        |
| <b>Team Recognition and Reward</b>       | <b>0.907</b> |  | <b>73%</b> |
| 20a                                      | 0.91         |  | 58%        |
| 20b                                      | 0.899        |  | 64%        |
| 20c                                      | 0.873        |  | 81%        |
| 20d                                      | 0.878        |  | 79%        |
| 20e                                      | 0.867        |  | 84%        |
| <b>Individual Recognition and Reward</b> | <b>0.909</b> |  | <b>74%</b> |
| 21a                                      | 0.895        |  | 69%        |
| 21b                                      | 0.905        |  | 64%        |
| 21c                                      | 0.895        |  | 70%        |
| 21d                                      | 0.88         |  | 79%        |
| 21e                                      | 0.866        |  | 86%        |

|   |              |  | %          |
|---|--------------|--|------------|
| <b>Intentions to Remain</b>             | <b>0.928</b> |  | <b>82%</b> |
| 22a                                     | 0.906        |  | 82%        |
| 22b                                     | 0.911        |  | 80%        |
| 22c                                     | 0.901        |  | 84%        |
| 22d                                     | 0.906        |  | 83%        |
| <b>Personal Involvement</b>             | <b>0.926</b> |  | <b>74%</b> |
| 23a                                     | 0.926        |  | 60%        |
| 23b                                     | 0.937        |  | 49%        |
| 23c                                     | 0.904        |  | 82%        |
| 23d                                     | 0.9          |  | 86%        |
| 23e                                     | 0.905        |  | 82%        |
| 23f                                     | 0.901        |  | 85%        |
| <b>Loyalty</b>                          | <b>0.915</b> |  | <b>75%</b> |
| 24a                                     | 0.89         |  | 78%        |
| 24b                                     | 0.893        |  | 77%        |
| 24c                                     | 0.897        |  | 74%        |
| 24d                                     | 0.89         |  | 78%        |
| 24e                                     | 0.909        |  | 66%        |
| <b>Career Development Opportunities</b> | <b>0.92</b>  |  | <b>86%</b> |
| 25a                                     | 0.9          |  | 85%        |
| 25b                                     | 0.919        |  | 82%        |
| 25c                                     | 0.835        |  | 92%        |
| <b>Employment Relationships</b>         | <b>0.908</b> |  | <b>73%</b> |
| 26a                                     | 0.909        |  | 60%        |
| 26b                                     | 0.878        |  | 79%        |
| 26c                                     | 0.878        |  | 80%        |

|                       |              |       |            |
|-----------------------|--------------|-------|------------|
|                       | <b>26d</b>   | 0.875 | 81%        |
|                       |              |       | 67%        |
|                       | <b>26e</b>   | 0.898 | 67%        |
| <b>Job Engagement</b> | <b>0.922</b> |       | <b>81%</b> |
|                       | <b>27a</b>   | 0.92  | 73%        |
|                       |              |       | 85%        |
|                       | <b>27b</b>   | 0.885 | 85%        |
|                       |              |       | 79%        |
|                       | <b>27c</b>   | 0.905 | 79%        |
|                       |              |       | 87%        |
|                       | <b>27d</b>   | 0.881 | 87%        |
|                       |              |       | 73%        |

**TABLE 3**  
**STABILITY OF THE RELIABILITY ACROSS DIFFERENT GROUPS**  
**Cronbach Alpha**

| <b>Scales</b>                       | <b>Male</b> | <b>Female</b> | <b>Union</b> | <b>Non-</b>  |              |            |
|-------------------------------------|-------------|---------------|--------------|--------------|--------------|------------|
|                                     |             |               |              | <b>Union</b> | <b>Paper</b> | <b>Web</b> |
| Organizational Satisfaction         | 0.948       | 0.95          | 0.953        | 0.939        | 0.948        | 0.952      |
| Job Satisfaction                    | 0.912       | 0.912         | 0.91         | 0.918        | 0.906        | 0.923      |
| Satisfaction with Supervisor        | 0.954       | 0.954         | 0.956        | 0.946        | 0.952        | 0.958      |
| Pay Satisfaction                    | 0.955       | 0.952         | 0.948        | 0.956        | 0.949        | 0.959      |
| Benefits Satisfaction               | 0.918       | 0.914         | 0.914        | 0.917        | 0.92         | 0.915      |
| Sat. with Physical Work Environment | 0.879       | 0.877         | 0.875        | 0.86         | 0.878        | 0.878      |
| Workload                            | 0.93        | 0.944         | 0.94         | 0.938        | 0.937        | 0.943      |
| Impact of Job on Personal Life      | 0.932       | 0.943         | 0.944        | 0.939        | 0.936        | 0.944      |
| Job Control                         | 0.925       | 0.918         | 0.916        | 0.924        | 0.918        | 0.925      |
| Job Clarity                         | 0.906       | 0.885         | 0.88         | 0.917        | 0.884        | 0.915      |
| Employee Involvement                | 0.895       | 0.886         | 0.877        | 0.891        | 0.888        | 0.891      |
| Org. Communication                  | 0.922       | 0.927         | 0.927        | 0.919        | 0.922        | 0.931      |
| Local Communication                 | 0.929       | 0.946         | 0.948        | 0.95         | 0.948        | 0.947      |
| Co-worker Cohesion                  | 0.93        | 0.93          | 0.933        | 0.924        | 0.926        | 0.939      |
| Resources and Supplies              | 0.94        | 0.933         | 0.937        | 0.935        | 0.934        | 0.942      |
| Inter-Unit Cooperation              | 0.927       | 0.927         | 0.931        | 0.924        | 0.934        | 0.924      |
| Continuous Quality Improvement      | 0.906       | 0.907         | 0.907        | 0.899        | 0.906        | 0.911      |
| Training Satisfaction               | 0.962       | 0.957         | 0.958        | 0.955        | 0.959        | 0.961      |
| Strategic Leadership                | 0.96        | 0.959         | 0.96         | 0.951        | 0.96         | 0.961      |
| Team Recognition and Reward         | 0.91        | 0.902         | 0.896        | 0.896        | 0.903        | 0.91       |
| Individual Recognition and Reward   | 0.913       | 0.906         | 0.905        | 0.888        | 0.902        | 0.917      |
| Intentions to Remain                | 0.923       | 0.929         | 0.929        | 0.924        | 0.928        | 0.929      |
| Personal Involvement                | 0.928       | 0.923         | 0.921        | 0.916        | 0.924        | 0.93       |
| Loyalty                             | 0.918       | 0.911         | 0.911        | 0.902        | 0.913        | 0.918      |
| Career Development Opportunities    | 0.917       | 0.917         | 0.911        | 0.919        | 0.922        | 0.918      |
| Employment Relationships            | 0.919       | 0.903         | 0.903        | 0.9          | 0.907        | 0.917      |
| Job Engagement                      | 0.918       | 0.906         | 0.922        | 0.916        | 0.93         | 0.923      |