A study of Individual Resilience and Support within the Energy, Mining and Infrastructure (EMI) Sector.

Abstract

Employees in the Energy, Mining and Infrastructure (EMI) sector have been identified as a high-risk population group exposed to both workplace and lifestyle hazards and sources of significant psychosocial stress related to turnover. The study proposes that, for international assignees working in isolated work environments, resilience and self-efficacy as personal resources influence a number of desirable outcomes including job satisfaction, work engagement, wellbeing, organisational commitment and intention to quit. The study further proposes that sources of support will affect individual resilience and self-efficacy. The study was conducted on remote sites in Indonesia with two large organisations in the EMI sector. Overall, good support for the hypotheses was found. Resilience as the key factor was found to be associated with job satisfaction, work engagement, wellbeing, organisational commitment and intention to quit. Perceived organisational support and having your children on site were positively related to resilience. Implications for practice and management are discussed.

Keywords

Resilience, Turnover, Perceived Organisational Support, Employee Wellbeing, Remote Work Environment, Expatriate Workers

1.0 Introduction

1.1 Background and Objectives

In recent years the energy, mining and Infrastructure (EMI) industries have been exposed to widespread organisational change alongside new policies, procedure and increased safety regulations. Employees in the EMI sector have been identified as a high-risk population group exposed to both workplace and lifestyle hazards (Parkes, 1998). Work on remote sites is widely regarded as stressful both in terms of lifestyle and health, where the physical environment, workload, privacy, work and living conditions, isolation from community and family as well as necessary travel are all stressors and demands faced and dealt with on a daily basis. These demands, while

mitigated by some potential benefits, are source of significant psychosocial stress related to turnover (Mearns et al., 2006).

The specific situational and social characteristics of the work environment are vital and in recent years with the changing nature of the industry it is becoming increasingly important understand these issues. Employees are often selected and trained for remote positions yet fail to cope with the demands of the job (Palinkas, 2003).

The shortages in, and retention of, a highly skilled workforce is a challenge in the EMI sector, where the contemporary working climate demands increasing levels of flexibility and efficiency while facing the implications of an ageing workforce (Mearns et al, 2006). There is no clear guidance or readily available tool in this field and a lack of consensus over the key psychological factors (predictors) which could, or should, be used as 'red flags' to assess the psychological fitness or resiliency of international assignees deployed to remote and foreign locations. It is increasingly recognised in the literature that investing in human capital and research to tackle turnover and retain this talent is vital for organisations and that understanding turnover intention is becoming much more than an academic exercise.

Publications on organisational behaviour, environmental psychology and similar fields have explored how the environment impacts upon attitudes, affect, and behaviour. Through research over the past several decades, there is a great deal we have learned about predictors of turnover intention in organisations but research in the context of isolated work environments has been neglected.

1.2 Isolated Work Environments & the Problem of Turnover

There is a wealth of existing literature on the impact of social isolation on turnover intention (Grey et al. 1993; Gillespie et al. 1995). In the context of Tshikondeni Coal Mine, a remote mining environment in China, Londolani (2012) identifies the biggest contributing factors for employee turnover as the

remoteness of location, isolation from essential services and local community. These findings support previous research by Palinkas (2003) in a study of psychosocial adaptation to isolated and confined environments as well as Mocellin et al. (1991) which found high levels of anxiety in polar environments. In a different context Igbaria & Guimaraes (1999) have investigated isolation in a cross-sectional study of telecommuters and non-telecommuters, finding significant differences between the two, with social isolation acting as a significant relating to turnover intention.

Although a number of studies that relate to the aims of this project have been published in recent years; research neglected the individuals in the changing work environments in the EMI sector, and while there exist numerous studies which have explored the impact of working in isolated communities and environments (Parkes, 1998; Iverson, 2000; Londolani, 2012) little research has dealt explicitly with an expatriate workforce. The specific situational and social characteristics of the work environment are vital. As the workplace changes and becomes tougher, it is increasingly important for employees to have the ability to cope with change, persist despite frustrations and bounce back from adversity, especially in an already challenging work environment and context (Fairbrother & Warn, 2003).

1.3 Personal Resources & Desirable Outcomes Relating to Turnover

Psychological resilience represents a process of adapting well in the face of adversity. In the literature, resilience has been linked to problem solving, coping strategies, ability to manage stress and diversity as well as self-awareness and reflection (Frideli, 2009; Palinkas, 2003, Coutou, 2002). While the bulk of existing research reviews resilience in a clinical context relating to childhood and/or adolescence (Werner, 1982; Masten, 1989), international research on resilience has increased substantially over the past two decades. Resilience has received increasing interest in organisational policy and practice (Friedli, 2009) with major international funders, including the Medical Research Council and the Economic and Social Research Council (UK) identifying resilience as an important factor for lifelong health and wellbeing.

A key area of literature relates to psychological wellbeing in the workplace. Daniels (1997) established that wellbeing and job features are not interdependent while more recent research has highlighted the importance of resilience and psychosocial adaptation to job features and work environments (Palinkas, 2003). Resilience is increasingly investigated in the context of its protective impact against inherent risk factors and in promoting positive individual outcomes. Findings have associated low resilience in individuals with poor mental health and wellbeing; greater, depression, psychiatric distress, anxiety, sleep problems and higher workload perception (Windle et al., 2011; Parkes, 1998; Mocellin et al., 1991; Warr, 1994). Consistent with these notions, a recent study showed resilience as a buffer to the impacts of high emotional demands on exhaustion among 388 bank employees (Bakker, 2007).

Conceptually similar findings are discussed in a review of the personal resource self-efficacy, which showed personal resources like self-efficacy, in addition to resilience, predicted motivation, performance, job and life satisfaction goal-setting alongside other desirable outcomes (Judge, Van Vianen, & De Pater, 2004). The literature suggests that this is because personal resources are strongly related to self-concordance, which determines inherent goal motivation and triggers higher performance and satisfaction in individuals (Luthans & Youssef, 2007). It is also proposed that self-efficacy and self-esteem alongside resiliency have strong links with competent adaptability in individuals (Carver, 1998; Werner, 1995; Cicchetti et al., 1993)

There is a wealth of research in the field, which suggests that high levels of resilience and self-efficacy have a strong positive association with organisational commitment, life and job satisfaction (Zautra, Hall and Murray, 2010; Bonanno et al., 2007; Moore, 2000; Lee & Ashforth, 1996; Leiter & Schaufeli, 1996; Schaufeli et al, 1995). Research further highlights organisational commitment as a strong predictor of turnover intention

(Mowday, et al., 1982) second only to job satisfaction (Cotton & Tuttle MA 1986). Longstanding empirical research has indicated the highly significant negative association between job satisfaction and turnover intent (Walsh, et al., 1985; Mobley, et al., 1979; Eby, et al., 1999).

The relationship between organisational commitment, job satisfaction and turnover intention has attracted significant attention. Iverson (2000), in research undertaken in a study of a remote mining community, indicates that community related variables followed by job satisfaction have the largest effect on life satisfaction, general wellbeing and intention to quit. Conceptually similar findings were reported in a more conventional working context by Igbaria and Greenhaus (1992) who found that job satisfaction was much more predictive of intention to quit and organisational commitment than a vast array of situational influences including age, education, salary and career opportunities. When employees feel committed to an organisation, and satisfied with their job they are likely to stay with the organization and turnover intention is less likely to be high.

The relationship between personal resources and work engagement has long been suggested and explored in Human Resource models. Stimulated by studies on burnout, work engagement is defined and characterised by vigor, dedication, and absorption as well as a positive, work-related state of mind (Schaufeli, Salanova, González-Romá & Bakker, 2002). Self-efficacy and resilient attitude have been shown to be significantly related to engagement scores (Bakker, 2009), while higher engagement scores have been strongly linked to significant outcomes including lower turnover and absence rates in organisations (Schaufeli & Bakker, 2004). Several studies focussing on personal resources have found that resilience facilitates engagement, acting as a buffer to the high impact of emotional demands on exhaustion (Hobfoll, Johnson, Ennis & Jackson, 2003). In concordance with this, a recent cross-sectional study of South African police officers found that highly engaged officers had active coping styles (Rothmann and Storm, 2003). Bakker, Gierveld and Van Rijswijk in a 2006 study among female school principals

showed that resilience, self-efficacy and optimism contributed highly to work engagement, explaining the unique variance in engagement scores. In a further study, Maslach, Schaufeli & Leiter (2001) found that the relationship between personal resources such as self-efficacy and resilience was increasingly salient in context of high job demands.

1.4 Determinants of & factors affecting Resilience and Self-Efficacy

There is strong evidence base for the impact of resiliency and self-efficacy on individual outcomes. In developing these personal resources it may be possible to improve desirable outcomes such as wellbeing, and tackle the issue of turnover intention. The research suggests that resilience can be enhanced through 'protective factors' such as coping strategies (Bonanno et al., 2007) and sources of support (King et al., 1998; Werner, 1995), which promote wellbeing or protect against inherent risk factors.

The effect of sources of social and organisational support on resilience is widely accepted. Rhoades and Eisenberger (2002) have demonstrated that high levels of perceived organisational support can enhance resilience to stress, additionally linking support to organisational commitment and organisational citizenship behaviours. Studies have also shown that resilient individuals are more likely to have higher levels of good social support than non-resilient individuals. Individuals with high levels of social support have been shown to be 40% to 60% more resilient than those with low reported social support (Netuveli et al., 2008).

This key role of support in maintaining physical and psychological health has been well documented (Ozbay et al., 2007). In a clinical context, numerous studies have shown that social support is negatively related to posttraumatic stress disorder (PTSD) symptoms (Bradley, Schwartz & Kaslow, 2005; Ozer et al., 2003; Wu et al., 2009). Similarly in a recent study by Campbell-Sills et al. (2006) increased resilience and social support were associated with fewer traumatic stress and depression symptoms. Further to this, resilience scores in the study were negatively associated with PTSD symptoms, and the individuals with PTSD symptoms had significantly low support ratings.

Poor support and social isolation have also been shown to be associated with negative health outcomes and increased mortality rates for a host of medical illnesses and diseases (Ozbay et al., 2007; Berkman, 1995). High levels of support appear to promote resilience as a buffer to protect against the full impact of mental and physical illness. The literature demonstrates the relationship between good social support, resilience and superior mental and physical health, which has been observed in diverse populations.

Theory suggests that psychological resilience and self-efficacy could be highly significant in relation to physical, mental and perceived demands of work, supporting desirable outcomes and in tackling the issue of turnover and wellbeing in the EMI industry (Werner, 2001; Palinkas, 2003). Little is known about resilience in this context to inform interventions and so research exploring the determinants of resilience for individuals in challenging and remote work environments provides an additional avenue of inquiry to the study.

1.5 Purpose of the Study

Supporting good outcomes despite a high-risk environment through investigating the protective factors which account for individual adaptation to adverse conditions makes a strong case for a study into resilience in the EMI sector. In this paper, existing research on turnover and its sources within traditional work environments are utilised to make predictions about the relationships in isolated work environments for international assignee (expatriate) workers. Specifically, in partnership with the International SOS Foundation (ISF), a non-profit research foundation dedicated to corporate responsibility and wellbeing research, this paper seeks to examine the deficiency of research into resilience in high-risk work environments; aiming to promote healthy people and healthy organisations through an understanding of the influence of resilience and self-efficacy on individual outcomes relating to wellbeing and turnover. In line with current theory the study also includes interpersonal and transpersonal support factors in an exploration of potential protective factors and individual differences in personal resources.

This research could provide guidance for the industry; its long-term, practical impact may add value to selection and training tools within the EMI industry. It has the potential to meet the moral duty to employees while enabling organizations to better fulfil their corporate social responsibility.

1.6 Research Questions & Hypotheses

In tackling this issue I will be asking the following key research questions:

1- Is 'resilience' a significant predictor of turnover intention, wellbeing and related outcomes for employees in isolated work environments?

2- Is 'self-efficacy' a significant predictor of turnover intention, wellbeing and related outcomes for employees in isolated work environments?

3- Do sources of support promote or protect measures of resilience and/or self-efficacy in employees working in isolated environments.

As illustrated in the research model (Figure 1), I hypothesise (H^{1}) that personal resources, having been found to be protective of other populations (Luthar and Zelazo, 2003; Rothmann and Storm, 2003; Carter, 1998), will also be protective for employees in high-risk isolated work environments. The model purposes that resilience and self-efficacy will have a protective impact on salient desirable outcomes including wellbeing, perceptions of job demands, job satisfaction, work engagement, organisational commitment and intention to quit. Further to this, in line with the literature and resilience theory I hypothesise ($H^{2)}$ that there will be a significant relationship between sources of support and resilience/self-efficacy measures.

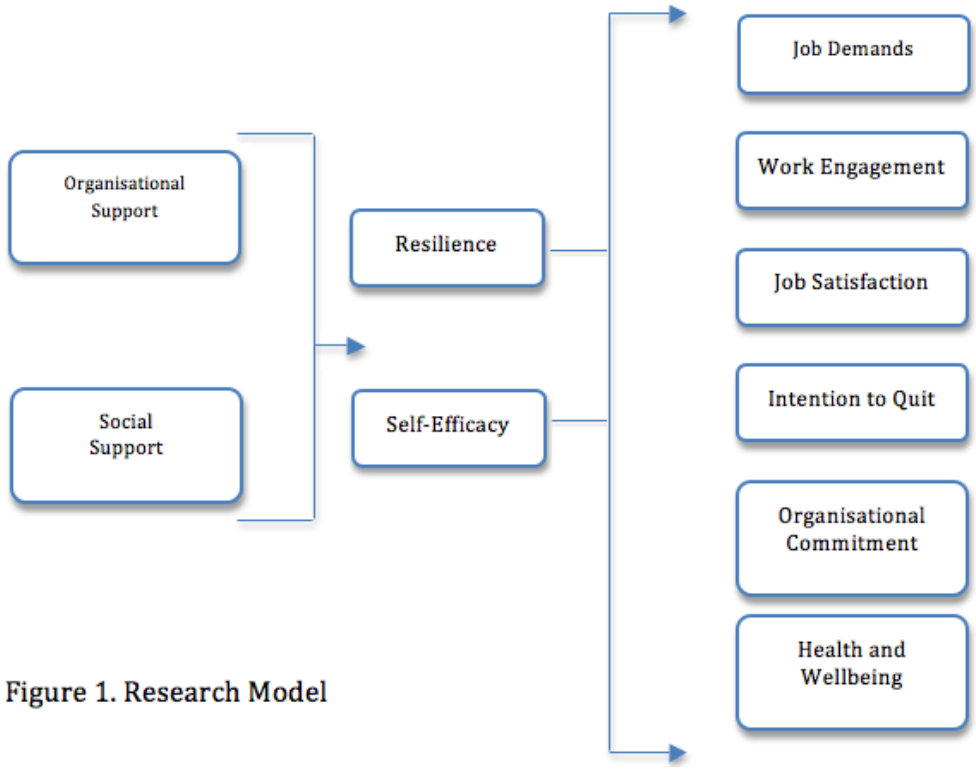

Figure 1. Research Model

2.0 Research Method

2.1 Participants

For the purposes of this study, potential participants were acquired through non-probability purposive sampling, using a defined population and sampling of relevant data sources to access the richest possible sources of information relating to our research questions (Patton, 2002; Brown, 1999; Miles & Huberman, 1994; Tesch, 1990). In this case and in meeting the inclusion criteria, the sample was sourced from expatriate employees working in isolated environments in the EMI sector.

The study was conducted on remote mining sites in Indonesia with two large organisations in the EMI sector. Organisation 1 is a global organisation with operating locations in regions of Africa, Asia Pacific, North America and South America. Site 1 (S1) is a gold and copper mine located on a remote tropical island in the Nusa Tenggara province of Indonesia. The mine site is responsible for the direct employment of over 7000 employees and has been

open since 2000, it is expected to remain operational for the next two decades.

Organisation 2 is a US based natural resource company with an industry leading global portfolio in mineral assets as well as oil and gas. It has a worldwide presence in the sector, with assets in North America, South America, Africa and Indonesia. Operational since 1972, Site 2 (S2) is well established as one of the world largest single recoverable copper and gold reserves, and is located in Papua province, Indonesia.

Both sites are geographically isolated and surrounded by dense tropical rainforest. All employees on S1 are based in the organisation's mining town. S2 employees however, are distributed over two separate town sites; the Highland (H) and Lowland (L) site. S2-H is a town built high in the mountains at almost 2000m, supporting the mine by providing accommodation for employees in close proximity to the mine itself. While, S2-L is a town built in the lowlands and is occupied largely by administrative employees. Employees from both sites are based in company provided housing within the respective communities. Despite the notable size of each site, the international assignee communities within the sites are relatively small at 39 (S1), 100 (S2-L) and 60 (S2-H) respectively.

Both sites meet the criteria for remote working environments and are fit-for-purpose in the context of this study. The participant group is highly representative sample of remote working populations, including representatives from the variety of occupations and fields on site including IT, maintenance, teaching, catering, mining, drilling, heavy machinery operation, administration, management and medical staff. The sample group additionally includes participants employed under both rotational and full time contracts.

2.2 Procedure

The study involved a survey of international assignee employees in the EMI sector working on two remote sites in Indonesia. It was undertaken using a

health and wellbeing questionnaire distributed to approximately 200 employees over the two sites, incorporating measures of resilience, self-efficacy, job satisfaction, work demands, general wellbeing, work engagement, organisational commitment, turnover intention, perceived organisational support and perceived social support. The study involved two stages, the initial development stage for the bespoke ISF health and wellbeing survey and the onsite stage in which data collection and socialisation of the survey took place with the participating organisations.

In it's early stages the direction and content of the health survey were developed from a variety of different sources including published work and studies relating to resilience, turnover intentions, wellbeing, work engagement, job satisfaction, organisational commitment as well as perceived support. A comprehensive review of the existing literature was conducted and from this, a number of measures and scales were pooled to generate the questionnaire items. Any bespoke development of measures was in line with guidelines laid down by Kline (1995).

Following a series of discussions and correspondence with organisational gatekeepers, a number of descriptive questions specific to remote work and international assignees were developed in order to gain better insight into this specific working context. In particular, items relating to full time and rotational work patterns as well as whether the family unit lived together on site were incorporated into the questionnaire design (Appendix 1). Gatekeepers reviewed and provided feedback on the questionnaire, and a number of pre-test versions were thoroughly investigated by all parties before ultimate amendments were made and the questionnaire was finalised.

The sample comprised of two participating organisations with access to two remote mining sites. A schedule was developed with each of the participating organisations to allow for a three-week survey phase for each site. Through links with International SOS Foundation (ISF), the onsite clinic staff and medical directors acted as the facilitators of the survey within the onsite

communities. Alongside Human Resources (HR) the clinic staff were also the point of contacts in each organisation.

In week one the clinic staff were provided with a brief outline of the background and purpose of the study as well as information sheets to hand out to aid in socialising the study. Targeted emails were distributed to all international assignees by on site HR to introduce the study, advertise an onsite visit by the researcher, forward the hyperlink to the online version of the survey and attach a hard copy version document to print and complete.

Week two involved a member of the research team visiting the site in person to further raise the profile of the study within the expatriate community and encourage increased participation rates. The researcher reintroduced the survey to the target population in both formal and informal face-to-face sessions while distributing hard copy versions of the survey as well as documents with the hyperlink to the online version of the survey.

In the third week a final email battery was sent out to all expatriate employees, encouraging completion of the survey. The concluding week allowed for continued socialisation of the project by the onsite clinic staff to bolster participation. Final data collection was completed online as well as in hard copy form, returned to the researcher as instructed in sealed envelopes through the onsite clinics. Over the two sites, of the approximately 200 distributed, 133 surveys were completed and used for data analysis, giving a mean response rate of 67%. Full demographics of the sample are appended (6.1: Table 1).

2.3 Measures

The final version of the ISF Health and Wellbeing Survey was available via online hyperlink and in an identical hard copy version, comprising of an 11-page document (Appended 6.2). The survey contained 11 sections, each assessing a different factor of interest to our research questions, grouped separately and accompanied by an introductory paragraph explaining how to

complete the section. The first page of the survey provided a brief of the purpose and background to the study; it also detailed instructions for completing the survey itself. The surveys were distributed to all international assigned employees apart from transient staff who failed to meet the specifications of the target group. The second page of the survey, the participant consent form, ensured and informed of the confidential, anonymous and voluntary nature of the study. On the final page of the hard copy version of the questionnaire addresses were provided and participants were instructed to return all completed surveys to the onsite clinics. Survey items were constructed based on literature sourced within occupational, behavioural and social psychology and the majority of scale items were pre-developed and validated by other researchers. A full description of item development, content and survey sections may be found in the Appendix (6.3).

2.4 Data Analysis

Although additional information was gathered at the request of the host organisations, only data relevant to the aims and hypotheses of this present study will be presented and discussed below. The data was analysed using SPSS Statistics (Statistical Package for Social Sciences) and a range of data management and statistical techniques were used throughout the analysis, including analysis of variance, Pearson correlation, t-test and multiple regression.

3.0 Results

3.1 Internal Validity of Scales

Cronbach's alpha scores were used to test the internal reliability of all scales. Perceived significant-other support (3 items; α =.77), general health and wellbeing (10 items; α =.81), perceived colleague support (3 items; α =.83) resilience (14 items; α =.87), self-efficacy (10 items; α =.87), perceived organisational support (8 items; α =.87) and work engagement (9 items; α =.92) were all highly reliable measures. Three scales were found to have

Cronbach's Alpha scores below .70; the seven-item General Satisfaction subscale (α =.67), five-item Organisational Commitment scale (α =.54) and the three-item Perceived Family Support scale (α =.54; *av.r =.33*). The items in these factors were not as highly correlated and therefore it should be noted that they may be less reliable as sub-scales. Due to low internal reliability two items in the seven-item perceived job demands scale were removed (Appendix 6.2, items 28 & 30) and a five item scale of perceived job demand was used in analysis (α =.54; *av.r =.19*). Similarly, one item (Appendix 6.2, item 81) was removed from the three-item job satisfaction scale and a two-item scale was used in further analysis (*r=.40*). The original two-item scales; intention to quit (*r=.39*) and perceived friend support (*r=.75*) correlated at appropriate levels for the subsequent analysis.

3.2 Descriptive Analysis of the ISF Health and Wellbeing Questionnaire

All variables were checked for normality distribution and all, bar perceived family support, were found to have acceptable levels of skew and kurtosis ie. within +/- 1.96 (Field, 2009). Perceived family support as a measure was highly skewed and kurtotic and was excluded due to its abnormality.

3.3 Correlational Analysis

Through one-tailed correlational analysis, resilience was found to strongly predict six outcome factors; general health and wellbeing (r=-.42, p<.000), general satisfaction (r=.29, p=.002), work engagement (r=.48, p<.000), job satisfaction (r=.24, p=.003), intention to quit (r=-.35, p<.000) and organisational commitment (r =.33 p<.000). Analysis revealed five outcome factors were significantly predicted by self-efficacy; general health and wellbeing (r =-.22, p =.006), general satisfaction (r=.21, p=.021), work engagement (r= .38, p<.000), intention to quit (r=-.18, p=.023) and organisational commitment (r =.20, p =.011).

Three aspects of support were identified to predict resilience; perceived significant-other support was significantly correlated, r=.22, p=.007, as well as perceived organisational support, r=.29, p=.001 and perceived friend support,

r=.16, p=.037. Two aspects of support were also found to predict self-efficacy with significant correlations of .16 (p=.036) for perceived friend support and perceived organisational support .18 (p=.023).

The vast majority of the correlation coefficients were found to be significant at either the 0.01 or 0.05 level. Perceived colleague support and perceived job demand scales were non-significant and excluded from the data in subsequent analysis.

3.4 Addressing our Hypotheses

Assumption testing and a full analysis of residuals was undertaken as part of each regression analysis, assumptions relating to multicollinearity, singularity and residuals were met and despite the small sample, inspection of the relevant scatter plots demonstrated linear relationships between the predictor and outcome variables, while casewise diagnostics alongside histograms and normal probability plots showed no evidence for abnormal distribution. As such there was no evidence that the regression models employed were disproportionately influenced by outliers or extreme cases (Field, 2009).

3.4.1 Hypothesis 1

In accordance with the hypotheses outlined in the introduction, stepwise linear regression analysis was used to test for relationships between resilience, self-efficacy and the desirable outcomes measures. The two dependent variables, resilience and self-efficacy, explained a total of 11-13% of the variance in turnover intention on the current scale (R^2=.13, AdjustedR^2=.11, F(2,125)=8.80, p<.000). However only resilience was found to have a significant independent effect (β=-.38, p<.000).

Self-efficacy and resilience together accounted for 19-20% of the variance in general wellbeing (R^2=.20, AdjustedR^2=.19, F(2,125)=15.29, p<.000), but resilience was the only significant independent predictive factor (β=-.47, p<.000).

Results of the regressions indicate the predictors explain almost a quarter (23-24%) of the variance in work engagement (R^2=.24, AdjustedR^2=.23, F(2,125)=19.51, p<.000), finding once again that resilience was the only significant independent predictor (β=.39, p<.000).

Together, the results show that self-efficacy and resilience also account for 4-6% of the variance in job satisfaction (R^2=.06, AdjustedR^2=.04, F(2,125)=3.77, p=.026) and 9-11% of the variance in organisational commitment (R^2=.11, AdjustedR^2=.09, F(2,125)=7.28, p=.001), with significant independent effects of resilience alone (β=.24, p=.026 and β=.31, p<.003 respectively).

Although there were no significant independent effects, the two also account for 5-7% of variance in employee general satisfaction (R^2=.07, AdjustedR^2=.05, F(2,93)=3.59, p=.032). In all cases, personal resources appear to predict improved outcomes, however only resilience has a significant independent effect.

3.4.2 Hypothesis 2

The same analytic technique employing stepwise linear regression was used to address our second hypothesis and test for the relationship between perceived sources of support, resilience and self-efficacy. Perceived significant-other, friend and organisational support were used as the predictor variables of Resilience. Higher levels of support lead to higher levels of resilience with the dependent variables explaining 7-10% of the variance in measures of individual resilience on the current scale (R^2=.10, AdjustedR^2=.07, F(3,125)=4.32, p=.006). As the only significant independent predictor, perceived organisational support contributed most to the model (β=.24, p=.01).

Perceived organisational and friend support explained 3-5% of the variance in reported self-efficacy (R^2=.05, AdjustedR^2=.03, F(2,125)=3.07, p=.05). There were no independent effects.

Correlational analysis and t-tests were used to investigate additional contextually relevant potential predictors of resilience. Results showed that the presence of a spouse living on site (M=54.6, SD=5.30.) as opposed to off site (M=52.3, SD=7,06.) did not cause a significant difference in levels of resilience, t(104)=1.61, p=.110. However significantly higher levels of resilience were reported for employees with children living on site (M=57.1, SD=5.72.) than off (M=51.9, SD=7.13.), t(65)=2.19, p=.032. This effect was also found when children attended school on site (M=57.1, SD=7.32.) as opposed to off site (M=51.6, SD=7.32), t(62)=2.27, p=.027.

While items relating to the variety of and participation in on site activities were not significant (r=.12, p=.091 and r=.14, p=.053 respectively), five-point Likert scale items relating to perceptions of safety on site (r=.29, p<.000), perceptions of community (r=.28 p=.001), and ease in keeping in touch with a support network (r=.165, p=.032) all correlated strongly with individual resilience.

Linear regression using ease of keeping in touch, perception of community and perception of safety on site as predictors of Resilience revealed a combined effect accounting for 9-12% of the variance (R^2=.12, AdjustedR^2=.09, F(3,126)=3.34, p=.007). Significant independent effects were found for Perceptions of safety (β=.22, p=.026) and perception of community (β=.20, p=.051).

4.0 Discussion

4.1 Significance of Results

In line with our first hypothesis and a wealth of research in the field several findings became apparent in our results; measures of resilience and self-efficacy consistently and significantly correlated with positive outcomes. Higher levels of resilience in particular positively influenced items including turnover intention, job satisfaction and organisational commitment. Our results revealed that individual resilience and self-efficacy account for a fifth of the

variance in employee wellbeing as well as explaining a quarter of the variance in work engagement.

Further analysis of the results revealed that while self-efficacy is a useful contributing variable, only resilience remained significant at independent levels. These results support the assumptions of our first hypothesis and theory that desirable outcome variables can be enhanced through the promotion and protection of individual resilience (Zautra, Hall and Murray, 2010; Bonanno et al., 2007; Moore, 2000; Lee & Ashforth, 1996; Leiter & Schaufeli, 1996; Schaufeli et al, 1995). In light of this, and in the hope of contributing to more positive organisational outcomes, identifying the possible determinants of resilience within the study formed the second stage and focus of investigation.

The second hypothesis, relating to the significant relationship between sources of support and resilience/self-efficacy measures was strongly supported by our results. In accordance with the hypotheses and theory outlined in the introduction, the analysis revealed that sources of support (perceived significant-other, friend and organisational support) had a significant combined effect on resilience, accounting for up to 10% of variance. As the only source of support with a significant independent effect with regards to resilience, a high level of perceived organisational support was identified as a driving factor of resilience.

Further exploratory analysis of the data identified four other significant contributors to resilience. These included having your child living as well as attending school on site, to a noticeable degree having your partner based on site (although the effect size was not quite significant) as well as positive perceptions of safety and a sense of community on site.

Many of the same factors that have been highlighted in the literature in the context of traditional organisations were also found in our study to be related to expatriate employees in isolated working environments. The current

findings can be examined in terms of this existing literature and dimensions, which have been previously identified (Rhoades & Eisenberger, 2002).

It has become generally accepted that sources of support (Zohar, 1980) are an essential component of resilience; findings indicating that resilience is affected by numerous sources of support wield strong theoretical backing. In particular, meta-analyses of the literature examining resilience have highlighted the significant impact of sources of support including both social and organisational contributors (Cooper et al. 2002). In line with this, Mearns et al (2006) in research undertaken for the Health and Safety Executive, identify organisational support as crucial to a healthy workforce and a positive health climate.

4.2 Strengths, Limitations, and Directions For Future Study

It is important to recognise some of the inherent weaknesses of the current study. Partly due to the limited sample size, the statistical analysis of the current data set was not optimal. In the current study, only an analysis of relationships has been conducted and although this has found a number of highly significant associations it does not account for causal factors. A larger participant group in future studies would enable hierarchical linear modelling to assess the associations at multiple levels to enrich findings. A larger sample size could also prove beneficial in re-examining items including the impact of having a spouse onsite on resilience. In line with theory, the lack of some statistically significant relationships could be due to the lack of power in this relatively small sample size.

Some dimensions, in particular relating to sources of social support, revealed smaller effects than would have been expected when their relationships with personal resource dimensions was examined. The subscale dimensions of social support contained relatively few items, making up scales of only two-three items total. These scales did not return particularly high reliability scores, which may explain the lack strong relationships or emergence of independent effects relating to resilience or self-efficacy. Care should

therefore be exercised in the interpretation of the results and it is recommended that future studies test and improve the reliability and power of scales by including more items within these dimensions.

A further shortcoming within the scale design relates to the framing of items; the majority of scales items are phrased positively, creating a one-sided impression of each subscale. In the literature and from a psychometric point of view this has been suggested to be inferior to scales that employ both negative and positively framed items (Price & Mueller, 1986). Although sourced from validated sources, the use of four-point Likert scales in the general wellbeing and self-efficacy measures can also be critiqued due to the inherent bias they imply (Bryman, 2004).

Existing research in the field focuses on employee and employer perspectives, neglecting on site partners and dependents as an area of potential study. Keeping in mind the significant influence of familial presence on site in promoting employee resilience measures, there is potential for research in this particular context to investigate family units in isolated work and living environments.

4.3 Implications, Conclusions & Recommendations

The study contributes to up-to-date findings in areas of topical importance to both academia and real life organisations. The results may have implications for corporate responsibility and duty-of-care as well as value in practical utility & application for research beyond the academic. Validated findings may have practical utility and application within the EMI industry, potentially contributing to selection, training and development tools and guidelines.

The importance of individual resilience should be recognised for it's potential in tacking turnover intention as well as promoting a range of highly important positive outcomes, most notably in this context relating to higher levels of employee wellbeing and work engagement in these high-risk population groups exposed to both workplace and lifestyle hazards.

However, while resilience is likely part of the solution to maintaining these individual outcomes in high-pressure work environments, it's not the whole story. The relationship has long been suggested and explored in Human Resource models and the research has significant practical implications for organisations in recognising the benefits of promoting and maintaining this individual resiliency.

This study suggests that it may be possible to enhance resilience through the promotion of perceived organisational support and the perceived safety of the work and living environment. Our research further identifies and highlights the existing need for organisations to recognise the importance of the family unit, the beneficial presence of partners and especially children on site. This also stresses, in the interests of maintaining healthy workers and a healthy organisation, the continuing importance to invest resources not just in and for the employees themselves but in their partners and dependents.

5.0 References

Ahuja, M et al. (2002) Overworked and isolated? Predicting the effect of work-family conflict, autonomy, and workload on organizational commitment and turnover of virtual workers. System Sciences, HICSS. Proceedings of the 35th Annual Hawaii International Conference.

Allan, A. & Love, A. (2010) Ethical Practice in Psychology: Reflections from the creators of the APS Code of Ethics. Wiley-Blackwell

Bakker, A.B. (2009). Building engagement in the workplace. In R. J. Burke & C.L. Cooper (Eds.), The peak performing organization (pp. 50-72). Oxon, UK: Routledge

Bakker, A.B., Hakanen, J.J., Demerouti, E., & Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. Journal of Educational Psychology, 99 , 274-284.

Berkman, L.F., (1995) The role of social relations in health promotion. Psychosom Med. 1995;57:245–54.

Bradley, R., Schwartz, A.C & Kaslow, N.J. (2005). Posttraumatic stress disorder symptoms among low-income African women with a history of intimate partner violence and suicidal behaviour: self-esteem, social support and religious coping. *Journal of Trauma Stress*, 18(6), 685-696.

Brinkmann, S. & Kvale, S. (2008). Ethics in qualitative psychological research. In C. Willig & W. Stainton-Rogers (Eds.), in The SAGE handbook of qualitative research in psychology (pp. 262-279). London: Sage.

Bryman, A. (2004) Social Research Methods, Oxford University Press. Chapter 3

Campbell-Sills L, Cohan SL, Stein MB. (2006) Relationship of resilience to personality, coping, and psychiatric symptoms in young adults. Behav Res Ther. Apr 2006;44(4):585-599.

Cotton, J. L. and Tuttle, J. M. (1986) "Employee Turnover: A Meta-Analysis and Review with Implications for Research," Academy of Management Review, 11(1), 55-70. workload [43,32,48].

Coutu, D. L. (2002). How resilience works. *Harvard Business Review,* 80(5), 46-50.

Eby, L. T., Freeman, D. M., Rush, M. C. and Lance, C. E. (1999) "Motivational Bases of Affective Organizational Commitment: A Partial Test of an Integrative Theoretical Model,"

Journal of Occupational and Organizational Psychology, 72, 463-483.

Ethics Committee of the British Psychological Society (2009) Code of Ethics and Conduct: Guidance.

Fairbrother, K. & Warn, J. (2003) "Workplace dimensions, stress and job satisfaction", Journal of Managerial Psychology, Vol. 18 Iss: 1, pp.8 – 21

Field, A. (2009) Discovering statistics using SPSS, Third Edition. SAGE Publications Ltd.

Gillespie, A., Rihardson, R., Cornford, J. (1995) Review of Telework in Britain: Implications for Public Policy. Journal of Organisational Change Management.

Hart, S. (2009) NASA-Task Load Index (NASA-TLX); 20 Years Later. NASA-Ames Research Center.

Hobfoll, S.E., Johnson, R.J., Ennis, N., & Jackson, A.P. (2003). Resource loss, resource gain, and emotional outcomes among inner city women. Journal of Personality and Social Psychology, 84, 632-643.

Igbaria, M. and Greenhaus, J. H. (1992) "Determinants of MIS Employees' Turnover Intentions: A Structural Equation Model." Communications of the ACM, 35(2), 35-49.workload [43,32,48].

Igbaria, M, & Guimaraes, T. (1999) Exploring differences in employee turnover intentions and it's determinants among telecommuters and non-telecommuters. Journal of Management Information Systems, Vol. 16, No. 1, pp. 147-164

Iverson, R. D. (2000) The Relationship between Job and Life Satisfaction: Evidence from a Remote Mining Community. Human Relations, vol. 53 no. 6 807-839

Judge, T.A., Bono, J.E., Erez, A., & Locke, E.A. (2005). Core self-evaluations and job and life satisfaction: The role of self-concordance and goal attainment. Journal of Applied Psychology, 90, 257-268

Luthans, F., & Youssef, C.M. (2007). Emerging Positive Organizational Behavior. Journal of Management, 33, 321-349.
Maslach, C., Schaufeli, W.B., & Leiter, M.P. (2001). Job burnout. Annual Review of Psychology, 52, 397-422.

Masten, A. S. (1989). Resilience in development: Implications of the study of successful adaptation for developmental psychopathology. In D. Cicchetti (Ed.), The emergence of a discipline: Rochester symposium on developmental psychopathology (Vol. 1, pp. 261-294). Hillsdale, NJ: Erlbaum

Myers, M. (2000) Qualitative Research and the Generalisability Question, The Qualitative Report, Volume 4, Number ¾

Mobley, W. H., Griffeth, R. W., Hand, H. H and Meglino, B. M. (1979) "Review and Conceptual Analysis of the Employee Turnover Process." Psychological Bulletin, 86, 493-522.

Mearns, K., Hope, L & Reader, T. (2006) Health and well-being in the offshore environment : The role of the organisational support. RESEARCH REPORT 376. Prepared by the University of Aberdeen for the Health and Safety Executive 2006.

Mowday, R. T., Porter, L. W. and Steers, R. M. (1982) Employee-Organization Linkages: The Psychology of Commitment, Absenteeism, and Turnover. New York, NY: Academic Press.
NASA (1986). Nasa Task Load Index (TLX) v. 1.0 Manual

Netuveli G, Wiggins RD, Montgomery SM, Hildon Z, Blane D. Mental health and resilience at older ages: bouncing back after adversity in the British Household Panel Survey. J Epidemiol Community Health. Nov 2008;62(11):987-991.

Ozbay, F., Johnson, D.C., Dimoulas, E., Morgan, C.A., Charney, D. & Southwick, S. (2007) Social Support and Resilience to Stress. From Neurobiology to Clinical Practice. Psychiatry (Edgmont).May; 4(5): 35–40.

Ozer, E.J., Best, S.R., Lipsey, T.L & Weiss D.S. (2003). Predictors of posttraumatic stress disorder and symptoms in adult: A metaanalysis*. Psychological Bulletin,* 129, 52-73.

Palinkas, L. A., (2003) The psychology of isolated and confined environments: Understanding human behavior in Antarctica. American Psychologist, Vol 58(5), May 2003, 353-363

Parkes, R. K. (1998) Psychosocial aspects of stress, health and safety on North Sea installations. Scandinavian Journal of Work, Environment and Health, Vol. 24, No. 5, pp. 321-333.

Rhoades, L, & Eisenberger, R. (2002). Perceived organizational support: A review of the literature. Journal of Applied Psychology, 87, 698-714.

Storm, K., & Rothmann, I. (2003). A psychometric analysis of the Utrecht Work Engagement Scale in the South African police service. South African Journal of Industrial Psychology, 29, 62-70

Schaufeli, W.B., & Bakker, A.B. (2004). Job demands, job resources and their relationship with burnout and engagement: A multi-sample study. Journal of Organizational Behavior, 25, 293-315.

Schaufeli, W.B., Salanova, M., González-Romá, V., & Bakker, A.B. (2002). The measurement of Engagement and burnout and: A confirmative analytic approach. Journal of Happiness Studies, 3, 71-92.

Walsh, J. P., Ashford, S. J. & Hill, T. E. (1985) "Feedback Obstruction: The Influence of the Information Environment on Employee Turnover Intentions." Human Relations, 38, 23-46.

Warr, P. (1994). A conceptual framework for the study of work and mental health. Work and Stress, 8, 84-97.

Werner, E.E. & Smith, R.S. (2001). Journeys from childhood to midlife: Risk, resiliency, and recovery. Ithaca, NY: Cornell University Press.

Werner, E. E. & Smith, R. S. (1982). Vulnerable but invincible: A study of resilient children. New York: McGraw-Hill.

Windle, G., Bennett, K.M., & Noyes, J. (2011) methodological review of resilience measurement scales. Health and Quality of Life Outcomes, 9:8

Wu, C.H., Chen, S.H., Weng, L.J. & Wu, Y.C. (2009). Social relations and PTSD symptoms. A prospective study on earthquake-impacted adolescents in Taiwan. *Journal of Traumatic Stress,* 00(0), 1-9.

Zautra, A.J., Hall, J.S. & Murray, K.E. (2010). Resilience: A new definition of health for people acommunities. In J.W. Reich, A.J. Zautra & J.S. Hall (Eds.), Handbook of adult resilience (pp. 3-34). New York: Guilford.

6.0 Appendix

6.1 Table 1. Sample Demographics

Variable/Characteristic	Categorisation	Sample percentage %
Response Rate	Site 1	67%
	Site 2	67%
Organisation contribution to Sample	Organisation 1 (Site 1)	20%
	Organisation 2 (Site 2)	80%
Gender	Male	95%
	Female	5%
Age (years)	18 - 25	1%
	26 - 35	15%
	36 - 45	32%
	46 - 55	32%
	56+	20%
Marital Status	Single	34%
	Married	66%
Responsible for dependents?	Yes	73%
	No	27%
Time with Current Organisation (years)	< 2	35%
	2 - 5	32%
	> 5	33%
Organisation	Organisation 1 (Site 1)	20%
	Organisation 2 (Site 2)	80%
Rotation	Yes	51%
	No	49%
Total Responses	n = 133 (/200)	67%

6.2 ISF Health and Wellbeing Survey

Information Sheet

Dear participant,

We would like to invite you to take part in our research study. **Please take time to read the following information carefully.**

This academic study is part of a final year postgraduate research project in Occupational Psychology at the University of Nottingham, exploring the impact of psychological resilience and coping strategies in reducing strain, tackling the issue of turnover and general well-being in the EMI (Energy-Mining-Infrastructure) industry. It aims to discover potential protective factors to explain individual differences in dealing with difficult situations and addresses the deficiency of research into resilience in high-risk work environments.

By participating in the study you will be contributing to research promoting healthy people, healthy organizations and healthy communities in isolated work environments. This research has potential long-term practical utility and application in contributing to selection, training and development tools and guidelines.

Any information provided will be treated in compliance with **UK Data Protection Laws.** In the event that the results of the study are published, your identity will remain confidential. This study has been favourably reviewed by the Institute of Work Health & Organisation Research Ethics Committee at the University of Nottingham.

If you decide to take part in the study you will be asked to provide a few personal details (e.g., gender, job title) and to complete a questionnaire or take part in an interview that should take approximately **10-15 minutes**. There are no time restrictions so feel free to work at your own pace.

Your participation is greatly appreciated and will make a huge contribution to my research. If you have any questions, queries or concerns regarding the study, please contact the researchers using the contact details below.

Thank you for your participation!

Participant Consent Form

Name of Researcher: Christie P Hancock

Please check box to indicate agreement

1. I confirm that I have read and understood the information presented. ☐
2. I understand that I may contact the researcher or supervisor if I require further information about the research ☐
3. I understand the purpose of the research project and my involvement in it. ☐
4. I understand that my participation is **voluntary** and that I am free to withdraw at any time, without giving any reason. I understand that should I withdraw then the information collected so far cannot be erased and that this information may still be used in the project analysis. ☐
5. I understand that my personal details will be kept **confidential.** ☐
6. I understand that my data from this study will be **anonymised** and that only members of the research team will have access to the data and my personal information ☐
7. I understand that I will be asked to complete a questionnaire and that the data from this will be used in future study reports ☐
8. I agree to take part in the above study. ☐

_____ _____

Date Signature

SECTION 1

1.	Are you Male or Female? *Please circle the appropriate gender.*	Male / Female
2.	How old are you? *Please circle the appropriate age category.*	18 – 25 26 – 35 36 – 45 46 – 55 56 – 65 65+
3.	What is your marital status? *Please circle the appropriate answer.*	Single In a relationship Married Separated/Divorced Widowed
4.	Do you have children?	Yes / No
5.	How old are your children?	
6.	What is your Nationality?	
7.	What is your Ethnicity?	
8.	What is your Religion?	
9.	What Organisation do you work for?	
10.	What is your current job title?	
11.	What site do you work at?	
12.	Do you work in the High or Low land site?	High Land / Low Land
13.	Have you had over 2 years accumulated experience on **this** remote site?	Yes / No
14.	How many years **total** experience do you have on remote sites?	
15.	How many years have you worked at your current organisation?	
16.	Are you on Rotation?	Yes / No
17.	Where did you grow up?	Urban Area / Rural Area
18.	Do you have an existing illness or acute / chronic medical condition requiring ongoing care?	Yes No I'd rather not say
19.	Do you drink more or less alcohol since working on a remote site?	More Less About the same

	Please indicate the degree of your agreement or disagreement with by circling the point on the scale that best represents your point of view.	*Very Unsatisfied*	*Unsatisfied*	*Neutral*	*Satisfied*	*Very Satisfied*
20.	How satisfied are you with the Health Clinic services on site?	1	2	3	4	5
21.	How satisfied are you with the School facilities on the remote site?	1	2	3	4	5
22.	How satisfied are you with the supermarket / commissary facilities on the remote site?	1	2	3	4	5
23.	How satisfied are you with your annual leave?	1	2	3	4	5
24.	How satisfied are you with your annual salary?	1	2	3	4	5
25.	How satisfied are you with the internet facilities on site?	1	2	3	4	5
26.	How satisfied are you with the accommodation on site?	1	2	3	4	5

SECTION 2
SECTION 3

SECTION 4

	The Following questions ask about your general well-being. *Please indicate the degree of your agreement or disagreement with each statement by circling the point on the scale which best represents your point of view.*	*Much less than usual.*	*Less than usual*	*Same as usual*	*Much better than usual*
33.	Have you recently been able to concentrate on whatever you're doing?	1	2	3	4
34.	Have you recently felt that you were playing a useful part in things?	1	2	3	4
35.	Have you recently felt capable of making decisions about things?	1	2	3	4
36.	Have you recently been able to enjoy your normal day-to-day activities?	1	2	3	4
37.	Have you recently been able to face up to problems?	1	2	3	4

	The next set of questions asks about your experiences during typical day or shift at work. *Please circle the appropriate point on scales to indicate your opinion.*		*Not at all*	*No more than usual*	*More than usual*	*Much more than usual*
27.	How mentally demanding is a typical day or shift at work?	Very Low ... Very High	1	2	3	4
28.	How physically demanding is a typical day or shift at work?	Very Low ... Very High	1	2	3	4
29.	How much do you feel you have to overcome your difficulties on a typical day or shift at work?	Very Low ... Very High	1	2	3	4
30.	How successful are you typically in accomplishing what you are asked to do?	Perfect ... Failure	1	2	3	4
31.	How hard do you have to work to accomplish your typical level of performance?	Very Low ... Very High				
32.	How insecure, discouraged, irritated, stressed, and annoyed do you get on an average day or shift at work?	Very Low ... Very High				

	The following questions relate to your experience of challenges at work. *Please indicate the degree of your agreement or disagreement with each statement by circling the point on the scale which best represents your point of view.*	*Strongly Disagree* *Disagree* *Neutral* *Agree* *Strongly Agree*

Section 5

43.	I tend to bounce back quickly after hard times	1 2 3 4 5
44.	I have a hard time making it through stressful events	1 2 3 4 5
45.	It does not take me long to recover from a stressful event	1 2 3 4 5
46.	It is hard for me to snap back when something bad happens	1 2 3 4 5
47.	I usually come through difficult times with little trouble	1 2 3 4 5
48.	I tend to take a long time to get over set-backs in my life	1 2 3 4 5
49.	I seek new challenges.	1 2 3 4 5
50.	I think difficulties form a part of life's valuable experiences.	1 2 3 4 5
51.	I don't like to do unfamiliar things.	1 2 3 4 5
52.	I can stay calm in tough situations.	1 2 3 4 5
53.	I find it difficult not to dwell on negative experiences.	1 2 3 4 5
54.	My behaviour changes from day to day with my mood.	1 2 3 4 5
55.	I feel positive about my future.	1 2 3 4 5
56.	I have a clear goal for the future.	1 2 3 4 5

SECTION 6
SECTION 7

	The following question relates to how you cope with difficulties at work. *Please indicate the degree of your agreement or disagreement with each statement by circling the answer that best represents your point of view.*	*Not at all true*	*Hardly True*	*Moderately True*	*Exactly True*
57.	I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
58.	If someone opposes me, I can find the means and ways to get what I want.	1	2	3	4
59.	It is easy for me to stick to my aims and accomplish my goals.	1	2	3	4
60.	I am confident that I could deal efficiently with unexpected events.	1	2	3	4
61.	Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
62.	I can solve most problems if I invest the necessary effort.	1	2	3	4
63.	I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
64.	When I am confronted with a problem, I can usually find several solutions.	1	2	3	4
65.	If I am in trouble, I can usually think of a solution.	1	2	3	4
66.	I can usually handle whatever comes my way.	1	2	3	4

	The next set of questions relate to how you feel at work. *Please circle the appropriate point on the scale to indicate how frequently you experience each statement.*	*Never -*	*Almost Never (few times a year)*	*Rarely (Once a month or less)*	*Sometimes (few times a month)*	*Often (Once a Week)*	*Very Often (A few times a week)*	*Always (Every Day)*
67.	At my work, I feel bursting with energy.	1	2	3	4	5	6	7
68.	At my job, I feel strong and vigorous.	1	2	3	4	5	6	7
69.	I am enthusiastic about my job.	1	2	3	4	5	6	7
70.	My job inspires me.	1	2	3	4	5	6	7
71.	When I get up in the morning, I feel like going to work.	1	2	3	4	5	6	7
72.	I feel happy when I am working intensely.	1	2	3	4	5	6	7
73.	I am proud of the work that I do.	1	2	3	4	5	6	7
74.	I am immersed in my work.	1	2	3	4	5	6	7
75.	At my work, I always persevere, even when things do not go well.	1	2	3	4	5	6	7

SECTION 8

	The following questions ask how you feel about your job and the organisation you work for. *Please indicate the degree of your agreement or disagreement with each statement by circling the point on the scale that best represents your point of view.*	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*
76.	I find that my values and the organisation's values are very similar.	1	2	3	4	5
77.	I feel very little loyalty to this organization.	1	2	3	4	5
78.	I am proud to tell others that I am part of this organisation.	1	2	3	4	5
79.	I would be just as happy working for a different organization if the work was similar.	1	2	3	4	5
80.	An individualís life goals should be work oriented.	1	2	3	4	5
81.	The major satisfaction in my life comes from my job.	1	2	3	4	5
82.	I would leave my profession if I could.	1	2	3	4	5
83.	I have a clear understanding of my job responsibilities and what is expected of me.	1	2	3	4	5
84.	I often think about leaving.	1	2	3	4	5
85.	I get a feeling of accomplishment from my job.	1	2	3	4	5

SECTION 9

	The next set of questions asks about your organisation. *Please indicate the degree of your agreement or disagreement with each statement by circling the point on the scale that best represents your point of view.*	*Very Strongly Disagree*	*Strongly Disagree*	*Mildly Disagree*	*Neutral*	*Mildly Agree*	*Strongly Agree*	*Very Strongly Agree*
86.	The organisation fails to appreciate any extra effort from me.	0	1	2	3	4	5	6
87.	The organisation would ignore any complaint from me.	0	1	2	3	4	5	6
88.	The organisation really cares about my well-being.	0	1	2	3	4	5	6
89.	Even if I did the best job possible, the organisation would fail to notice.	0	1	2	3	4	5	6
90.	The organisation cares about my general satisfaction at work.	0	1	2	3	4	5	6
91.	The organisation shows very little concern for me.	0	1	2	3	4	5	6
92.	The organisation takes pride in my accomplishments at work.	0	1	2	3	4	5	6
93.	The organization values my contribution to its well-being.	0	1	2	3	4	5	6

SECTION 10

	The final set of questions asks about your support network. *Please indicate the degree of your agreement or disagreement with each statement by circling the point on the scale that best represents your point of view.*	*Very Strongly Disagree*	*Strongly Disagree*	*Mildly Disagree*	*Neutral*	*Mildly Agree*	*Strongly Agree*	*Very Strongly Agree*
94.	There is a special person available when I am in need.	0	1	2	3	4	5	6
95.	There is a special person in my life that cares about my feelings.	0	1	2	3	4	5	6
96.	My colleagues really try to help me.	0	1	2	3	4	5	6
97.	I get the emotional help and support I need from my family.	0	1	2	3	4	5	6
98.	I have a special person who is a real source of comfort to me.	0	1	2	3	4	5	6
99.	My friends really try to help me.	0	1	2	3	4	5	6
100.	I can count on my colleagues when things go wrong.	0	1	2	3	4	5	6
101.	I can talk about my problems with my family.	0	1	2	3	4	5	6
102.	I have friends with whom I can share my joys and sorrows.	0	1	2	3	4	5	6
103.	My family is willing to help me make decisions.	0	1	2	3	4	5	6
105.	I can talk about my problems with my colleagues.	0	1	2	3	4	5	6

SECTION 11

106.	Who do you rely on as your primary source of support while living and working on site? *Please circle the appropriate answer.*	Spouse / Significant Other Family Member Friends Colleagues Managers
107.	Is your primary source of support based on site?	Yes No
108.	What method do you primarily use to keep in touch with your support network while on site? *Please circle the appropriate answer.*	Phone Call Text Message Email Skype Social Network Other _____

109.	How frequently do you have contact with members of your support network off site? *Please circle the appropriate answer.*	Never – Almost Never (A few times a year) Rarely (Once a month or less) Sometimes (A few times a month) Often (Once a Week) Very Often (A few times a week) Always (Every Day)
110.	Does your spouse live with you on site? *Please circle the appropriate answer.*	Yes No N/A
111.	Do your children live with you on site? *Please circle the appropriate answer.*	Yes No N/A
112.	Do your children go to school on site? *Please circle the appropriate answer.*	Yes No N/A
113.	Do you have a pet on site? *Please circle the appropriate answer.*	Yes No
114.	*Please select the appropriate point on the scale opposite which best reflects your opinion.*	*Strongly Disagree* *Disagree* *Neutral* *Agree* *Strongly Agree*
115.	It is easy to keep in touch with my support network.	1 2 3 4 5
116.	There is a strong sense of community in this environment.	1 2 3 4 5
117.	There is a high standard and variety of recreational activities and resources on site.	1 2 3 4 5
118.	I participate highly in the group and recreational activities on site.	1 2 3 4 5
119.	I feel safe living and working on site.	1 2 3 4 5

6.3 ISF Health and Wellbeing Project: Item Development, Content and Survey Sections

Section 1 - General Information

Section 1 comprises of a set of 19 questions designed to collect basic descriptive information about respondents including gender, marital status, experience with remote working and shift pattern.

Section 2 – Site satisfaction

A seven item scale of respondent satisfaction with the facilities and salient characteristics of each site were developed and measured on Likert scales ranging from1=Very Unsatisfied to 5=Very Satisfied.

Section 3 – NASA Task Load Index (NASA TLX)

A six item scale for task demands was adapted from the NASA Task Load Index (1986) scale participants indicating the appropriate point relating to perceived work demands along a 21 point scale with labelled extremities (Very Low / Very High).

Section 4 – General Wellbeing

A 10 item measure for wellbeing was adapted from the shortened General Health Questionnaire -12 using a Likert scale ranging from 1 = much less than usual to 4= much better than usual and 1= not at all to 4= much more than usual for reverse code items (questions 38-42 in Appendix 6.2). Low scores indicate fewer symptoms of ill health.

Section 5 – Resilience

Resilience, organisational commitment, job satisfaction and intention to quit were all measured on five point Likert scales ranging from 1= strongly agree to 5= strongly disagree. The 14-item resilience scale was constructed from the 6 item Brief Resilience Scale as well as 8 additional components of

resilience adapted from the Adolescent Resilience Scale 'novelty seeking', 'emotional regulation' and positive future orientation'. 6 scale items were reverse scored (questions 44, 46, 48, 51 & 53. Appendix 6.2) meaning higher values were associated with higher resiliency.

Section 6 – Self-Efficacy

The 10 item Self-Efficacy factor was adapted from the General Self-Efficacy Scale (Schwarzer & Jerusalem) and measured on Likert scale ranging from 1= not at all true to 4= exactly true.

Section 7 – Work Engagement

Work engagement measured incidence of behaviour on a 9 item, 7 point Likert scale ranging from 1=Never to 7=always (every day) with a mid point of 4=sometimes (a few times a week). The scale was shortened from the Utrecht Work Engagement Scale (UWES; Schaufeli & Bakker, 2003; Schaufeli et al., 2002), which has been validated in several countries including China (Yi-Wen & Yi-Qun, 2005), Finland (Hakanen, 2002), Greece (Xanthopoulou, Bakker, Demerouti & Kantas, 2007a), South Africa (Storm & Rothmann, 2003), Spain (Schaufeli et al., 2002), and The Netherlands (Schaufeli & Bakker, 2003; Schaufeli et al., 2002). High scores are associated with high levels of work engagement.

Section 8 – Organisational Commitment, Job Satisfaction and Intention to Quit

Organisational Commitment, Job Satisfaction and Intention to Quit were measured over 10 items on a 5 point Likert scale ranging from 1= strongly agree to 5= strongly disagree. The scale items were drawn from a validated item bank provided by the Institute for Employment Studies. Negatively worded questions (Questions 77 & 79. Appendix 6.2) were reverse coded before any statistical analyses were conducted. High scores in this scale are associated with high job satisfaction, organisational commitment and high intention to quit.

Section 9 – Perceived Organisational Support

Perceived organisational support was measured on a 7 point Likert scale ranging from 0 = Strongly disagree to 6 = strongly agree. The 8-item scale was adapted from the Perceived Organisational Support Scale (University of Delaware; 1984).

Section 10 – Perceived Social Support

Perceived social support was measured on a 7 point Likert scale ranging from 0 = Strongly disagree to 6 = strongly agree. The 11 items were sourced from the validated Multidimensional Scale of Perceived Social Support (Zimet et al, 1988), dividing into factor groups relating to sources of social support, namely family, friends, significant other and colleagues. Higher scores are associated with high level of perceived social support.

Section 11 – General Information relating to Sources of Support in Remote environments

This section contained a set of 9 questions designed to collect basic descriptive information about sources of support and networks for international assignee workers as well as a final scale. The 5 item, 5 point Likert scale ranging from 1= strongly disagree to 5= strongly agree measures contextually salient items relating to remote site environment and living adapted from discussions with on site gatekeepers and informed by literature. The scale includes items such as ease of maintaining contact (question 115), participation in on site activities (question 118) and perception of safety on site (question 119). Higher scores are related to positive outcomes.