Job Stress among Engineers in Hydro Projects

Prof. S. K. Karki,
PhD, Candidate, Singhania University.
Email - karkisital@yahoo.com

Abstract: *The study was among the engineers in hydro projects of Nepal at construction site for Job Stress with N=219 between May to October, 2016. Level of Stress is considered as measured in (21) items that are self-developed and has been taken from American Institute For Stress (AIS) (8) items where by the studied found mean value of (2.652) and (2.68) as moderately stressed. The job stress and intention to stay found correlated. Highest three causes of job stress was insufficient tools and equipment for work (3.17) followed by the Insufficient staffing (3.06) and Improper pay and compensation practice (3.02). AIS in this study found most stressful on Reward and recognitions (3.28).The lowest stress was on interpersonal relationship (1.86), clarity on role (1.92) and AIS: lowest was on ability to use skill and talent (2.08). The employers/ organizations are recommended to practice required tools, equipment and human resources as well as at the same time must practice for better reward system at hydropower site.*

Key Words: *Job stress, Intention to leave, Job Demand, Job Control, Job burn out.*

1. INTRODUCTION:

Job Stress:

Arnold and Feldman, (1986) defines stress as relation of individual with new or threatening factors in their work environment. These observed different phases of body in response to threat. (McGrath, 1975) argued moderate level of stress empower people to perform better (Lawless, 1992) said if stress is far greater it will decrease performance and concerning health issues. The increased levels of job stress with the perception of control but unlimited of demands have been effected to be associated with increased rates of heart attack, hypertension and other disorders.

History:

According to (Hungarian Researcher) Hans Seyle, in 1936 gave name "Stress" with analogy to engineering, so initial definition became cloudy as per Cooper (2000). Harkness et al (2005) found being stress is normal state of work. The objectivist stream is based on its strong association with medical and biological sciences (Seyle, 1936). So research has been long dominated by experiments and quantitative analysis, e.g. consequences, cause-effect. Now in last decades, need has urged subjectivist research approach for contextual, local understanding of phenomena that would be capable of grouping the social creation of meanings associated with work stress (Harkness et al, 2005; Kinman and Jones,2005; Munby, 2004) as cited by (Sizilas, 2011).

Job Burnout:

Maslach and Jackson defined it as long-term stress response of an individual to prolonged exposure to emotion and interpersonal stressors at work which encompasses emotional exhaustion, depression and reduced personal accomplishment. Researches show increasing number of employee experiencing job burnout. Effects of stress: (Seyle, 1936; Holmes and Rathe, 1967 Holmes and Masuda, 1974) as cited by (Sizilas, 2011).

Consequences of stress:

Physical change, Physiological change, Behavioral change are as general Adoption Syndrome (GAS) model of Selye, 1946 as cited by (Sizilas, 2011) 3 stages: This theory suggested first of all: Alarm stage, Resistance Phase and Exhaustion Stage. Throughout the world research has shown that work related stress is a significant problem and represent a major challenge to occupational health. Work related stress is a common and costly problem that leave few workers untouched (Kennedy and Grey 1997: 20, MUS Costa and Hick 1998: National Institution of Occupational Safety and Health, 2002).

2. THEORIES ON JOB OR OCCUPATIONAL STRESS (OS):

Theory on stress started with as Scientific foundation of Research by Hans Seyle in 1936 (Sizilias, 2011). Origin of Concept of Stress (Seyle in 1936) was From GAS model (Seyle in 1946) to dynamic equilibrium today. The Transitional model: JD- R, (Lazanus, 1991),The JDC (Karasek, 1979),The Effort– Reward Model (Siegrist, 1946), Equity Theory (Adams, 1963),Organizational Theory (OJ) (Greenberg &Colquitt, 2005), The cybernetic model of stress (Edwards, 1992),The P-E fit model in 1970 (Salvecz, 2008; Juhast, 2002; Edwards, 2000), Palmar & Cooper model of work stress was cited in (Sizilias, 2011).

The job demand- control -Resource model of Karasek (1979) is taken as basic theory and (ILO, 2006) study on job stress in construction industry as basis of causes of stress. The result is compared with other studies. Job Demand Control Model (JDC Model)**:**This theory stats stress is related with demand of job**.** Job demand – Resources Model (JDR Theory)**:**(Lazarus, 1991;Lazarus and Foirman,1989;Lazarus and Laudien,2008)as cited by (Sizilas,2011); JDC-S model (Karasek, 1979) as cited by (Sizilas, 2011).When job demand is more than available resources then stress rises. Two processed are assured:

1. When job demand exhausts individuals energy.
2. A motivational process shortfall of resources prevents effectiveness.
3. Interpersonal relationship

3. METHODS:

The method of study are quantitative and x- sectional. The tools has been taken from American Institute for Stress (AIS) scale, used with permission and self-developed (21) items stress scale (self-developed). Around the population of 500 engineers in various hydro projects over the Nepal was surveyed using web based and paper based survey method with sample size N=219. The analysis was done by SPSS 20.0 version. Reliability test was by Cronbach's Alfa(r) and association was analyzed by Pearson's coefficient.

4. ANALYSIS & DISCUSSION:

Job Stress Aspect wise

Table Level of Various job Stress (21items) was measured by self developed four sub factor Job Stress Scale.

Table 1:Level of Job stress
Item Statistics

	Mean	Std. Deviation	N
Job Demand			
I feel stress due to improper pay and compensation of the project	3.02	1.317	183
I feel stress due to promotion, transfer and career growth practice in the project	2.89	1.204	183
I am comfortable to shift, rest periods and work loads	2.65	1.053	183
I feel stress due to poor job security of my job	2.87	1.319	183
The employer is stable secured and keep concerns on me	2.92	1.053	183
Project Team Support			
I have good interpersonal relationship at my job	1.86	0.826	183
I have interpersonal conflict in my job	2.39	1.078	183
I participate indecision making	2.30	1.090	183
I get adequate support, understanding and reliability from other people	2.19	0.937	183
I feel discrimination at my work place	3.71	1.162	183
Project work Control			
I have clear role on my job	1.93	1.077	183
I feel job stress due to high concentration and high performance required on my job	3.15	1.222	183
I feel stress due to more non-technical nature of my job	2.74	1.341	183
I have all knowledge and skills required for this job	2.02	.937	183
I can delegate my over work to others	2.84	1.135	183
Project Resources			
I have to work in isolation	2.66	1.243	183
I am comfortable with location of work place	2.35	1.118	183
I am comfortable to physical environment	2.32	1.171	183
I feel proper planning and site condition, in the project	2.67	1.196	183
I feel tension due to insufficient staffing (human resources)	3.06	1.219	183
I feel tension due to inadequate equipment and tools	3.17	1.270	183

The level of stress on (21) items scale were found (reliability of 0.73) (2.652) Moderately stressed. Highest being insufficient tools and equipment for work(3.17) followed by the insufficient staffing (3.06). Improper pay and

compensation practice (3.02) was another major cause of stress. The lowest stress was on interpersonal relationship (1.86), I was clear on role (1.92) and I have knowledge and skill require (2.02). The reliability and stress level was found in literature are comparable and good (0.730).Now the stress on first sub group general job factors (14.35) is highest, Project environment (16.23, in 6 items) is second cause, Project work (12.68) is third and Project team (12.45) is the fourth or lowest among four sub factor. Thus one can recommend improving the project environment specifically with adequacy on tool/ equipment and staffing. Job demand on pay , compensation, benefits is recommended to improve. The discrimination should be immediately practice with main streaming. "The concentration and performance requirement " recommended analyzing. Now let's compare the four sub factors: Deleting " I have to work on isolation " one item all sub factor have now 5 items each, the total of each sub factors are: 14.35(demand, Project general job factors), 12.45(support, Project Team),12.68(Control, Project work) and 13.57(Resources, Project Environment). Without much debating the model of JDC-S-R, I can say the stress due to job demand is highest and resource available at site is insufficient to suit the employee P-E fit. Comparatively the support of organization and Social is better. Similarly based on well known theory of Job Characteristics by Hackman and Oldham, 1975 job satisfaction was found higher and job stress due to control available on stress is also lowest among four sub factors. While analyzing further we can conclude: if discrimination at work (may be various types), the project team or Support will still improves and does not create Distress. In the same way if stress due to high concentration and performance is reduced, distress due to control on job or stress from Project work will be reduced considerably. Why this is recommended is clear these two one in each sub factor are only items which have stress level mean of above (3). This much finding along with the finding and recommendation from AIS scale below is Sufficient complete research question and objective of this study. While conducting bi-variant and multivariate analysis the relationship of these four sub factor with AIS measure overall stress is as follows.

Overall Stress (AIS)

Table 2: Level of Overall Job Stress (8 items AIS)

	Mean	Std. Deviation	N
Environment Condition at work is unpleasant sometimes unsafe	2.80	0.950	193
My job is affecting health and emotional wellbeing	2.68	1.026	193
I have too much work to do and or too many unreasonable deadlines **(Demand)**	2.98	0.921	193
I find difficult to express my opinions or feelings about my job conditions to my superiors **(Supervisor Support)**	2.65	1.145	193
I feel job pressure interfere with my family or personal life**(Demand)**	2.70	1.123	193
I have adequate control or input over my work duties (**Control)**	2.26	0.922	193
I receive appropriate recognition or rewards for good performance**(Demand0**	3.28	1.176	193
I am able to utilize my skills and talents to the fullest extent at work (**Control)**	2.08	0.984	193

AIS in this study found most stressful on Reward and recognitions (3.28) ;Too many works and unreasonable dead line (2.98) second; unsafe and unpleasant (2.8) third, job pressure interfering family (2.7); affecting health (2.680). The lowest was able to use skill and talent (2.08) as it was one of the highest job satisfaction factor. The overall stress level as measured by AIS overall (8items) scale was found 2.68moderately stressed (score added all 8 mean values, 21 to 25).

In India CI job stress was measured in 65 public and private organizations (Saikale and Selvani, 2015) N=117 and found heavy volume of work, improper administration, work pressure, lack of feed back, change in scope of work as sources of job stress among Architects and construction professionals.

5. CONCLUSION:

Level of Stress as measured in (21) items self developed and American Institute for Stress (AIS) 8 items were found mean value of (2.652) and(2.68) in both moderately stressed. The respondent are among 21% of us (AIS), only 11% individual are above this level. All other 68% are below of this level. Highest source of stress being insufficient tools and equipment for work (3.17) followed by the insufficient staffing (3.06) and improper pay and compensation

practice (3.02).AIS in this study found most stressful on Reward and recognition as (3.28);too many works and unreasonable dead line (2.98) second, unsafe and unpleasant workplace (2.8).

The recommendations to employer, engineers and project managers are to measure job stress on regular interval and improve the stress level to an optimum level. Improvements on resources and organization of stress management program could be some of them.

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