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AN INVESTIGATION ON EMPLOYEES' JOB SATISFACTION IN NUCLEAR POWER PLANT AT KUDANKULAM, INDIA

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ABSTRACT

The purpose of the survey is to know the employees' job satisfaction on job itself, workload, job time, conflicts between job and family, sense of job achievement and anticipation of occupational development in Nuclear Power Plant, and to provide references for future development of human resources in Nuclear Power Plant. The inventory used in survey is the one developed by researchers and stratified random sampling is employed to select participants. The conclusions include that the general job satisfaction of employees in Nuclear Power Plant needs to be further enhanced, many employees have conflicts between job and family, and have low anticipation to occupational development. There are differences between the employees working in the Main Control Room (who are simply called as the "operators" hereafter) and the employees working on other positions (who are simply called as the "non-operators" hereafter). Namely, operators show higher proportions than non-operators in terms of good feelings about job, maximum devotion to the job, high demands of trainings, and optimistic anticipations of the occupational development, but lower proportions in the leisure time with family members and taking vacations when necessary.

KEYWORDS

Employees of nuclear power plant, Job satisfaction, Survey.

1. INTRODUCTION

With the exacerbation of environmental pollution and the crisis of non-renewable energy resources, many countries have been considering the nuclear power as a substituted resource. In the 11th National Five Year Plan, Chinese government put forward a strategy of "to actively develop the nuclear power", which means the nuclear power industry in China will meet a historic opportunity with accelerated development. To develop the nuclear power, safety is an important issue. The operators working in the Main Control Room of the reactor building of Nuclear Power Plants shoulder important responsibilities for the safety of Nuclear Power Plant. Though the operators' job satisfaction can not completely forecast their behavior actions relative to the safety, but the job satisfaction can forecast in some extent employees' devotions, enthusiasm, absence rate, and demission tendency which are factors affecting the safety of the nuclear power plants. Meanwhile, non-operators are the necessary composing part of Nuclear Power Plants, and their job satisfaction can impact the overall morale of the employees in Nuclear Power Plant. To investigate and analyze the employees' job satisfaction can help us know the current status of the employees as well as provide references for the future policy regarding to the human resources development in Nuclear Power Plant. So far, there is no research aiming at the employees' job satisfaction in Nuclear Power Plant in India. In order to collect primary information, we conducted the survey.

2. METHODS

2.1. PARTICIPANTS

This survey selected 267 participants from Nuclear Power Plant by stratified random sampling. Among the participants, there are 94 operators who control the reactor and 173 non-operators, 245 males and 20 females. All operators are male. The participants under the age of 30 are 124, between 31 to 40 are 130 and over 40 are 12.

2.2. SURVEY TOOLS

The inventory used in this survey is the close-ended inventory compiled by the authors of the article who took some relevant researches as references as well as combined the uniqueness of Nuclear Power Plant. The inventory consists of 16 multiple choices questions, and each question is followed by three choices. Participants were required to select one choice which fits themselves the most. The inventory contains the following aspects: the subjective feelings about the job itself, the subjective satisfaction to the workload and the job time, the conflicts between job and family, the others' approval and the anticipation of the professional development.

2.3. DATA COLLECTING AND PROCESSING

The inventories were distributed to participants when they were on duties. After the inventories were returned, we used the software of SPSS 11.0 to statistically analyze the data and the statistical methods are the percentage statistic and proportion variances test of independent sample.

3. RESULTS AND ANALYSIS

3.1. SUBJECTIVE FEELINGS ABOUT THE JOB ITSELF

In Taber & Alliger's research, they found that the satisfaction with job itself had remarkable correlation with the overall job satisfaction (Dail, 2004, pp.2-3). In another word, the more pleasure that employees' can get from their jobs, the higher their overall job satisfaction is. It means we can infer the overall job satisfaction by satisfaction with job itself. Therefore, we asked participants to answer the following questions.

3.1.1 SUBJECTIVE FEELINGS ABOUT THE JOB

The results showed that 45.5% participants "like their jobs". Among them, the operators were 58.1%, and the non-operators were 38.7%. The significant difference test of percentage indicated that there is statistical significant difference between the operators' proportion and non-operators'. The value of "Z" was 2.54, $P < 0.05$.

3.1.2 DEVOTION TO THE JOB

Longtime dissatisfaction with the job would induce decreasing of employees' devotion to the job (Raymond, 2005, pp.475 & 485). The survey results showed that 30.1% participants "could always keep maximal devotion". Among them, the operators were 41.9%, and the non-operators were 23.7%. The significant difference test of percentage indicated that there is statistical significant difference between the operators' proportion and non-operators', the value of "Z" was 2.92 and $P < 0.01$.

3.1.3 REQUIREMENTS FOR THE PROFESSIONAL TRAINING

The research of US MCI Corporation indicated that training was the second important influencing factor in the factors of affecting employees' job satisfaction. Training is a way for employees to learn interpersonal skills and professional techniques, and can facilitate employees to work more effectively. Due to its uniqueness, Nuclear Power Plant relies on the high-tech heavily which means employees may need trainings to support their work. The survey results showed that 68.8% participants thought they "need to take frequent trainings to be competent for their jobs". Among them, the operators were 82.3% and the non-operators were 61.3%. The significant difference test of percentage indicated that the percentage of operators was higher than the percentage of the non-operators, the value of "Z" was 3.357 and $P < 0.01$.

3.1.4 TENDENCY OF CHANGING POSITIONS

Employees may demission themselves from their positions if they feel dissatisfactory with their current positions and it is hard to change the work conditions (Raymond, 2005, pp.475 & 485). The results indicated that 53.4% participants answered that "often think about of changing their positions". Among them, the operators were 49.5%, and the non-operators were 55.5%. The significant difference test of percentage indicated that there was no statistical significant difference between the operators' proportion and non-operators'.

According to the above results, we can get two points as follows:

Firstly, almost 1/2 participants "like their current jobs", short 1/3 participants "can always keep maximal devotion to their jobs", over 1/2 participants "often think about changing their positions" and over 2/3 participants thought "they need frequent trainings to be competent for their positions".

Secondly, there are differences between the operators and the non-operators. Operators have higher proportions than non-operators on items of "liking their present jobs", "maximal devotion to their jobs" and "training requirements", (the value of "Z" respectively was 2.54, 2.92, 3.35 and $P < 0.05$, or $P < 0.01$). One reason to explain the differences may be the characteristics of operators' job. In Nuclear Power Plant, it is operators' job to insure the safe operation of the nuclear reactor and its relative systems in every second because the safety of the reactor affects not only the successful electricity generating, but also the development of the nuclear power in India. The importance of the operators' job cannot but arouse the managers' more attention. The significance of the job and the attention of the managers will endow values to operators which consequently will produce more satisfactory sense. When employees feel satisfactory, they will keep maximal devotion to their jobs. Furthermore, since operators realized the potential risks underlain in their jobs, they need more training to be competent.

3.2 SUBJECTIVE SATISFACTION SENSE WITH THE WORKLOAD AND THE WORK TIME

In Rice, Gentile & Mefarlin's research, they found that "the work time and the employees' control sense to the work time are the two important factors composing job satisfaction (Dail, 2004, pp.2-3, 183-184)". And some other researches indicate that one of various stressors in the organization is the overload of the work responsibility. How do these factors impact the employees' satisfaction in nuclear power plants?

3.2.1 WORK TIME

Due to the particularity of the nuclear power, Nuclear Power Plants usually locate on the sites with less population. Though the daily work time in Nuclear Power Plants is 8 hours, since the worksite is away from town site, usually, employees' choose to take lunch break at worksite which means the total duration at work site is longer than 8 hours. Therefore, will the employees' satisfactory senses with the work time be impacted? The survey results indicated that 52.5% participants thought "the job time is too long". Among them, the operators were 41.9%, and the non-operators were 58.2%. The significant difference test of percentage indicated that the percentage of non-operators was obviously higher than the percentage of the operators, and the value of "Z" was 2.54, $P < 0.05$.

3.2.2 WORKLOAD

The survey results indicated that 36.6% participants thought "the workload was too heavy", among them, the operators were 37.6%, the non-operators were 36%. And 58.8% participants thought the present workload was moderate, among them the operators were 57%, the non-operators were 59.3%. The significant test of percentage indicated that there is no significant difference between the proportions of the operators and the non-operators. The value of "Z" was 0.16, $P > 0.05$.

3.2.3 VACATION

Generally speaking, taking vacations when necessary represents one's control sense in work and it is also one of factors of influencing the employees' job satisfaction. The survey results showed that 82.8% participants answered that "they could not take vacations when necessary". Among them, the operators were 94%, the non-operators were 78%. The significant difference test of percentage indicated that the percentage of the operators was obviously higher than the percentage of the non-operators, and the value of "Z" was 3.22. $P < 0.01$.

According to the above survey results, we get the following two points.

Firstly, over 1/2 participants thought "the work time was too long", over 1/3 participants thought "the workload was too heavy" and over 2/3 participants could not take vacations when necessary..

Secondly, there are differences between the operators and the non-operators in terms of work time and vacation control. Namely, more non-operators think work time is too long and more operators feel less control of their vacations. One possible reason to explain the difference may be different job characteristics. Most non-operators work in daytime and have to spend the whole day including lunch break at the worksite which may impose them the feeling of working longer than 8 hours. On the contrary, operators work on shifts and shift duration and transmission usually are fixed. As a result, fewer operators think work time is too long. On the other hand, due to the fixed shift system, it is not easy for operators to take vacations freely which makes operators feel less control of the time.

3.3 CONFLICTS BETWEEN JOB AND FAMILY

Ayree and his colleagues indicated that the conflicts between job and family could affect not only the employees' psychological happiness, but also their job attitudes, and further result in some relevant actions such as absence, retardation or demission (Dail, 2004, pp. 183-184). The negative emotion induced by the family conflicts could be very easily transferred to the job and affect job efficiency. Working on shifts makes operators' work and rest schedule not match that of their family members. Will this cause some conflicts?

3.3.1 LEISURE TIME WITH OTHER FAMILY MEMBERS

The survey results indicated that 33.8% participants answered that "they could seldom eat with their families". Among them, the operators were 46.2%, and the non-operators were 27.2%. The significant difference test of percentage indicated that there is statistical significant difference between the proportion of operators and non-operators, and the value of "Z" was 2.79, $P < 0.01$.

3.3.2 FAMILY MEMBERS' COMPLAINTS

The results indicated that 52.1% participants answered that "their families often complain the family life is affected". Among them, the operators were 62.4%, and the non-operators were 46.5%. The significant difference test of percentage indicated that the percentage of the operators was obviously higher than the non-operators, and the value of "Z" was 2.23, $P < 0.05$.

From the above survey results we could see that, 1/3 participants could spend little leisure time with their families, over 1/2 participants' families complained the family life was affected. That means both operators and non-operators had conflicts between job and family. However, operators' proportion is higher than non-operators.

3.4 OTHERS' APPROVAL AND ANTICIPATION OF THE PROFESSIONAL DEVELOPMENT

In an organization, supervisors and colleagues are the two most important colonies impacting the employee's job satisfaction (Raymond, 2005, pp.475 & 485). Some other researches indicate that the promotion anticipation is one of professional stressors for employees. Employees who are optimistic with their professional development will enjoy better mental health, body health and job satisfaction than those who aren't (Zhang, 2006, p.90).

3.4.1 SUBJECTIVE PERCEPTION ABOUT THE SUPERVISORS' APPROVAL

The results showed that 46.6% participants thought "their supervisors comparatively affirm their work performance". Among them, operators were 41.9%, and the non-operators were 49.1%. In addition, 51.5% participants were not sure whether their performance was approved by their supervisors. Among them, the

operators were 57% and the non-operators were 48.6%. The significant difference test of percentage indicated no statistical proportion differences and the values of "Z" respectively were 0.75 and 0.99, $P > 0.05$.

3.4.2 SUBJECTIVE PERCEPTION ABOUT THE COLLEAGUES' APPROVAL

The survey results indicated that 62% of participants thought "their colleagues comparatively affirm their work performance". Among them, the operators were 68.8%, and the non-operators were 58.4%. The significant difference test of percentage indicated no statistical proportion differences. The value of "Z" was 1.54, $P > 0.05$.

3.4.3 ANTICIPATION OF THE PROFESSIONAL DEVELOPMENT

The results indicated that 27.2% participants answered "hard working can bring opportunities for promotion". Among them, the operators were 41.3%, and the non-operators were 19.7%. The significant difference test of percentage indicated that the percentage of the operators was obviously higher than the percentage of the non-operators, and the value of "Z" was 3.95, $P < 0.001$.

From the above survey results, we can get the following three points.

Firstly, over 1/2 participants were not sure whether their supervisors affirm their performance. Maybe there were communication problems between the supervisors and the underlings. Some researchers showed that in an organization, the approval of significant others' was an important source of employees' satisfaction and could influence the tendency of the individual demission.

Secondly, less than 1/3 participants thought "hard working can bring the opportunities for promotion". It seemed that many participants didn't agree the hard working was an important factor for professional development. It is very easy for an employee to feel unsatisfied with his/her work and decrease the devotion to job if he/she doesn't believe that endeavor is related with professional development.

Thirdly, more operators, compared with non-operators believed the hard working could bring opportunities for promotion. Such difference between operators and non-operators could be attributed to the important roles of operators in Nuclear Power Plant. Since managers paid more attention to the operators, it is easier to notice their work performance and hard work which may result in more opportunities for promotions than other positions.

4. CONCLUSIONS

To sum up, we obtain the following conclusions:

Firstly, the overall job satisfaction of employees' in Nuclear Power Plant needs to be further improved. This point is manifested by the following aspects: only about 1/2 participants liked their own job, 1/3 participants could keep maximal devotion to their jobs, and about 1/2 participants had the tendency to change their positions.

Secondly, the conflicts between job and family experienced by employees shall not be neglected. The survey results showed that about 1/2 participants' families complained the normal family life was affected by work. This should be noticed by the managers. It is easy for employees to experience negative emotions when they have conflicts with their spouses or family members. As a result, employees would attribute this negative result to their jobs or the organization and produce unsatisfied feelings about the jobs which may affect work efficiency. A serious family conflict may disperse employees' attentions, and increase the accident probability. If it is not possible to change the current working systems such as working on shifts, managers could consider some other methods to alleviate such conflicts. For example, to establish a reasonable vacation system, to organize family parties on a regular basis etc.. These compensatory measures can facilitate mutual understanding of family members and to decrease negative emotions.

Thirdly, the differences between operators and non-operators demonstrated through the survey should be taken into account when policies related to human resources development to be made. Due to the importance of their positions, operators have higher proportions in positive feelings about their work, maximum devotions to their job, high demand of training, approved work performance and optimistic anticipations of occupational development. On the contrary, non-operators have lower proportions on those items. Non-operators are a necessary part of Nuclear Power Plant. The negative emotions and lower satisfactions surely will impact the overall morale as "group emotions" when these feelings are perceived by others. Therefore, the managers of Nuclear Power Plants should constitute more scientific, effective and human-centered managing policies according to the job characters and different psychological experiences of operators and the non-operators to fully enhance the employee's job satisfaction. One of managers' responsibilities is to create a harmonious workplace in which all employees can actualize their values. When employees feel satisfied with their work, they will devote themselves delightedly to their jobs. As a result, invisible power underlain in humans will be transferred into visible profits. That is very thing that human resources development tries to work on.

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