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Application of the Concept “People-oriented” to Improve the Working Team Safety Construction

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Abstract

Working team is the grass-roots organization in the enterprise, and as the vast majority of working team, blue-collar workers engaged in manual labor which is more dangerous, and are required to comply with the safety and health regulation, on the other hands, workers are also the main sufferers in industrial accidents. Therefore, team safety construction becomes the key part of the enterprise safety management, which will be directly attributable to the stability of enterprise, which’s one critical goal is protecting workers from danger. In this paper, situation and shortcomings of working team in safety construction will be analyzed, and, it points out the focus of team safety construction is applying ‘people-oriented’ concept in management and mastering the ‘Man factor’ based on ‘4M ’ theory. And then, as the focus, the writer will highlight several approaches to strengthen working team safety construction by establishing safety responsibility, assessment system, conducting safety education, improving initiative of foreman and providing condition of work safety.

Keywords: Working team safety construction, People-oriented, Team education, Incentive mechanism

Working team is the cell organization of the enterprise, as the members of working team, workers who are directly perform production and operation activities, are exposed to various hazards, and are also the main sufferers in industrial accidents. As to ensure that worker and work environment safe is the obligation and target of enterprise, team safety construction is as important as the foundation for enterprise safety construction. However, poor safety awareness, lack of safety skills, high rate of accidents are all significant problems faced by working team, and also include unclear safety responsibility, boring

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and simple safety activities or education, rigid management system and others. In one word, it is severe for team safety construction. How to reinforce working team safety construction has been one focus and will be discussed as follow.

1. The accident-causing theories and analysis of influencing factors

Accident-causing theory is used to research the causes, process and consequences of accidents. The ‘4M’ theory is the theory summed up accident chain reaction theories, and is widely applied, which attributes accident to the ‘Man factor’, ‘Machine factor’, ‘Media factor’ and ‘Management factor’. For working team, foreman and worker is the main subject of the ‘Man factor’, and the ‘Machine factors’ include equipment, control system, structure, method of operation, ‘Media factors’ are the team’s production process in working environment, technology environment, and ‘Management factors’ are mainly embodied in the safety culture, safety management assessment and so on.

According to the statistical data, the main reason of 88% electric power accidents are unsafe behaviors; the main reason of 75% ~ 80% maritime, traffic accidents are related to ‘Man factor’; the 42.4% construction accidents due to violating the operating rules or labor discipline according to one statistics of 2005-2006 construction accident ... ...It is obvious that Man factors become the most prominent factors in‘4M'thory. And there may be some accidents caused by other factors outwardly, but after further investigating, the indirectly reason may all relate to the Man factor. Therefore, the key point for working team safety construction is to control the ‘Man factor’. Considering most workers working as labor-intensive in our country, even engaging in hazardous industries, the role of ‘Man factor’ in working team safety construction will be more outstanding.

2. The concept of ‘people-oriented’ and team safety management

What the ‘people-oriented’ management is the management with people as the focus, and the main objection of which is to inspire initiative, enthusiasm of workers and to let workers work creativity, and to achieve common development between workers and enterprise. The status of the ‘Man factor’ is an important basis for conducting safety management with ‘people-oriented.

To insist on ‘people-oriented’ concept, works which are helpful to promote enterprise to protect the life and health of workers from hazards, should be priority to fulfill. Conducting ‘people-oriented’ management, controlling the effects by ‘Man factor’ is deemed as the center on works, therefore, it should give full play to the team’s initiative and value, strengthen the role of the positive factors, and inhibit, reduce unsafe behavior or the effects of other adverse factors, and maximize to satisfy human need.

Worker’s safety behavior is affected by many factors, which include the physiological reasons (fatigue, lack of sleep, physical reasons and diseases), safety awareness and proficiency of working skill, mental state and operating habits, emotional and relationship with partners. To improve the positive effects of Man factors in working team safety construction, enterprise must analyze and take advantage of these factors correctly. Thusly, safety awareness and the sense of responsibility should be strengthened and safety skills should be improved in safety construction, furthermore, enterprise should also enhance workers initiative, develop emotional care and create appropriate working environment to satisfy human needs, as to reduce fatigue of workers and unsafe operations.

3. Approaches of team safety construction by implementing ‘people-oriented’ concept

- Establish and improve the safety responsibility system, strengthen implementation and evaluation of safety responsibility

The safety responsibility system should be prepared based on the safety objective, actual condition and the job duty, and the aim of this system is to make all persons perform according to safety responsibility and make the responsibilities with corresponding 'rights', to form a strict and efficient
safety management responsibility system, which is an important approach to achieve enterprise safety target. Workers’ participation involved in the process is deemed necessary to strengthen this system’s rationality, operability and pertinence.

- **Strengthen implementation and evaluation of safety responsibility**

  In order to make person perform safety responsibility more effectively, it should be briefed to all workers and signed on letter timely, and then, it is more important to establish the evaluation system of safety responsibility link up with salary and conduct in time. It also could improve foreman to act his responsibility by implementing job competition, appointment letter, the mortgage safety plan. etc. Furthermore, PTW system is advised as it is in favor of tracing responsibility by signing.

  At the same time, it should strengthen the inspection and assessment. Once unsafe acts are observed, they would be corrected, recorded timely, as index for responsibility evaluation. For incident or accident, investigation must be conducted according to the ‘Four No’ principle, and it will be another way to improve responsibility’ implementation.

3.1. **Strengthen foreman cultivating, improve foreman’s enthusiasm and creativeness**

  Foreman is very important for safety system construction, who is the production organizer, safety educator, supervisor, person conducting first emergency response. The enterprise should pay more attention on cultivating foreman for good job skills, understanding management, strong sense of responsibility, and with the ability for coordinating.

  To establish a scientific management system with proper safety responsibility corresponding to the right, is an effective way to enable foreman to perform on duty. Foreman should carry out the responsibility consciously and be a good example for others, and foreman should insist on principle, which is ‘work safe is for production, and production must be safe’ and ‘any violation must be corrected’. In economic factor, enterprise should give foreman more ‘economic promotion’ to widen the gap in wages with general worker, otherwise, enterprise should implement ‘performance pay’ system, and give high award to foreman and team without violation, accidents, realizing safety standardization after evaluation. In the factor of education, enterprise should strengthen foreman’s management art, methods, communication skills, and enhance their professional skills, master safety management, technical knowledge and emergency procedures. etc by in-house training or other educations.

3.2. **Safety education and promotion to enhance worker’s safety skills and awareness**

  The objective of safety training is to improve the workers with the knowledge, skills and attitudes that will enable them to perform their duties in a safe and efficient manner and change from ‘want me to be safe’ to ‘I want to be safe’, ‘I will be safe’.

  - **Enrich education in content, enhance the pertinence of training**

    Safety laws, regulations, in-house rule, safety technical knowledge and skill should be educated in safety training, and as to strengthen job education, risk assessment and control measures briefing before work is always a good method. And one most important principle must be noted that the training should be closely related to work, specific and pertinence for strengthening safety awareness.

  - **Establish safety training system and conduct daily education**

    Technical training and occupation education should be strengthened to improve worker safety and operation skills, adapt to the trend of information technology, automation and mechanization. All workers should go through safety introduction before working and be briefed after applying new techniques, new technologies, new materials, new equipment, and some special works are required to be performed only
by competent persons or holders of relevant certificates and license. Furthermore, safety cycle activity, briefing, education before or after holiday or at critical period and others are also important.

- **Enrich methods for team safety education**

  Safety activities should be easy to understand, and various, rich in content, lively and vivid. Practical learning should be focused on safety skills education by conducting safety quiz, safety technology course, emergency evacuation, aid demonstration, safety operating demonstration or providing video show, conducting monthly briefing and displaying of safety signs, poster to familiarize the workers on safety matters. In the meanwhile, safety awareness education should focus on the value of safety operation and the necessity of the safety behavior to make all workers realize that working safety is more important for their family, on the other hands, analysis of the possibility harmfulness of accident is a good way to educate worker know the consequences of accident deeply, and it will be helpful to overcome paralysis thought and fluky psychology, and put an end to habitual peccancy or reckless misconduct.

3.3. **Guarantee the rights and interests of workers, establish incentive mechanism and develop full management**

  Worker emotional and ideological is the main factor for influencing job operation. Therefore, team management should master the psychological and emotional factors, and caring worker on life, guaranteeing the rights and interests of workers, helping to solve the practical difficulties, and cherishing, respecting for worker, increasing the subsidies and welfare standard are usual methods to meet worker’s emotional needs. At last but not the least, adequate exchanges on emotion with workers making worker feel warm working in this team are also necessary.

  Enterprises should strengthen team responsibility and establish incentive mechanism, which link up safety benefits with salary, it will be valid and play an incentive role to other workers by giving bonus, souvenirs and awarding to safety outstanding workers, in addition, publicizing the winning individual or team on bulletin board, meeting widely, will make them generate a sense of honor and a positive faith by selecting ‘safety team’, ‘advanced individual’.

  In order to implement full management in working team, worker participation should be fully absorbed, for example, team worker should be involved in preparation of working standard, in-house rule, team assessment and democratic elections for foreman and others. Furthermore, enterprise shall respect the suggested right of workers, and properly adopt workers’ recommendations.

3.4. **Provide supporting measure for team safety construction**

  Enterprises must provide supporting measure for team safety construction actively. First of all, the arrangement of production should be reasonable, and then, enterprises should increase investment, provide adequate assurance measures. Depending on scientific and technological progress, enterprises should vigorously promote the mechanization, standardization and automation facilities; and provide standardized, ‘People-oriented’ safety facilities to ensure that working conditions are fit for human body, working habits. In addition, ventilation, cooling facility and lighting and other welfares will help to reduce labor intensity and occupational hazards. Meanwhile, workers' dormitories, canteens, rest areas, water points, toilets and so on should be also provided.

  Team safety management should combine Man factor and other factors judiciously, and should control the adverse effects of ‘Media factor’, ‘Machine factor’ and ‘Management factor’ to meet worker’ basic needs on the operating environment, operating facilities.

3.5. **Focus on working site, implement standardization work and PTW system**

  Team safety construction should focus on working site and establish reasonable procedures to control risk.
Risk management is an important safety management method, and it should be implemented in team safety construction. The procedure of risk management is identifying the hazards in operation, estimating the risk levels, then, selecting control measures and educating workers in tool box meetings. It should be noted workers participation is necessary in this process.

The establishment of work standard procedure will be helpful for limiting the unsafe act. Firstly, the enterprise should analyze whole operating system and decompose operating procedures as steps, and then, improve this operation process and form an optimal operating procedure base on technology, regulations and practice experience. The standardization work system will provide operating procedures, standard to limit the human behavior in order to control illegal operations, minimize unsafe actions.

Permit to work system shall be advised for dangerous works, such as working at height, hot works, lifting and others. PTW system is one good measure to strengthen the safety inspection before working and to urge all persons perform their safety responsibilities. The procedure of PTW system is that the person-in-charge inspects the machine, after confirming all be safe for this works, fills one PTW form and applies this Permit from the authorizer, only can start working after approving by the authorizer.

Working site should be monitored closely and the scope of supervision including Man - Machine - Media system. Besides, the supervision should be improved on the key place or high-risk works to control the primary hazards.

4. Conclusions

As the cell of enterprise, team safety construction is one key part of the whole enterprise safety management. Handling relation between safety and production correctly is the prerequisite for team safety construction, furthermore, it should be also critical by giving a reasonably production indicator, and formulating a scientific safety objective. Meanwhile, safety construction system has been one key factor for development of enterprise. This paper discusses that working team safety construction should highlight ‘people-oriented’ concept and master Man factors, and, this paper also points out team works should play full role of responsibility system, and establish incentive mechanism, meanwhile, strengthening safety skills, training and education, constructing a reasonable incentive mechanism, combining ‘Man factor’ and ‘Media’, ‘Machine’, ‘Management’ factors, would be good measures to promote the enterprise safety construction effectively.

References

[1] Zhang Dejiang. Promote advanced team, cherish posts and devote wholeheartedly to work, strengthen safety construction on coal mine team comprehensively [R]. 2010.12.26
[2] Tan Rong, Zhu Xianyan. Team safety education is a stepping stone to the team safety management[J].China Electric Power Education. 2010. (30)
[3] Ge Jiade. Practices in establishment of new working team safety management system [J]. Coal Economic Research. 2011. (2)
[4] Zhou Gang, Cheng Weimin, Zhu Ge Fulin, Ye Wen. Analysis and Exploration on Correlative Theories of Man-made Errors and Human Unsafe Behaviors. China Safety Science Journal (CSSJ)
[5] Liu Xiaojun. Team safety construction should insist on the concept ‘People-oriented’[J]. Electric Safety Technology. 2005 (4)
[6] Zhou Jianhua. Re-Understanding Safety Factors and Safety Management[J]. Navigation of China. 2010(10)
[7] Wang Lizheng, Fang Dongping. Analysis of the Cause and Countermeasures construction accidents in China[M]. China WaterPower Press, Intellectual Property Press 2007