

Human Resource Managements as a part of the Human Factors Management Program(HFMP) for Nuclear Power Plants

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1. Introduction

Programs for the effective implementation and management of human factor issues in nuclear power plants (NPPs) should contain technical criteria, an establishment of a job process, and activities for job improvements and be a system through which human factors can be managed in an integrated way. Human factors to be managed should include those related to an operation of plants as well as those related to a plant design as mentioned in NUREG-0800(2004), NUREG-0711(2004), and NUREG-0700(2002). Human factor items to be managed for an operation of plants are listed in the PSR (Periodic Safety Review) items defined in the Enforcement of Regulation of the Atomic Energy Act. They are procedures, a work management system including a shift work management, a qualification management of plant personnel, training, a work amount assessment, a MMI (Man Machine Interface), and the use of experience. Among these factors, factors related to a human resource management include work management systems and the status of a work management including shift work, a qualification management ensuring qualified workers on duty at all times, and the systems for and the status of training and education. This paper addresses the scope of a human resource management, guidelines and procedures to be developed for a human resource management, and considerations critical in the development of guidelines and procedures.

2. A Scope of Human Resource Management

The HFMP (Human Factors Management Program) is a program for systematic and integral management of human factors in NPPs. Human resources should be managed within the frame of HFMP. Figure 1 shows an operation process for the HFMP.

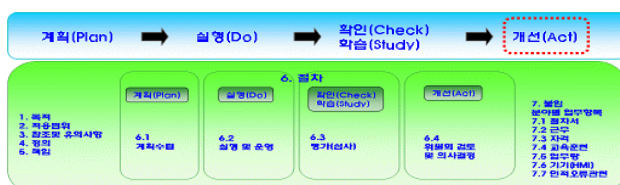


Figure 1. An Operation Process of HFMP

The scope of a human resource management is decided from the assessment criteria of international and domestic PSR (IAEA, 2003; DaeHo Kim and YongHee Lee, 2005^{ab}), the factors that are found to be managed carefully as results of PSR activities, the factors defined

as causal human factors in event reports written by the regulatory body, and our reviews of examples in NPPs of foreign countries and other domestic and international industrial domains (e.g. military, shipbuilding companies, automobile manufacturers).

2.1 Work-related human resource management

For human resources that are related to a work management, guidelines for a general work management including shift work, and guidelines for a working hour management including a job substitute, overtime, and emergency work will be developed. The guidelines for a working hour management are intended to be used to keep legal working hours and to prevent human errors due to excessive working hours. Guidelines and procedures for an application and management of periodic medical examinations and special medical examinations will also be developed for a workers' health management. In the application of these guidelines, the characteristics of NPP a workplace should be considered. The guidelines should include job stress management and musculoskeletal disorder management. Guidelines for a workplace risk factor management and a work environment assessment (for main control rooms, remote shutdown rooms, and local control stations), and guidelines for the management of risk factors from the aspect of a human performance including the principles of a safety sign making, should also be considered.

2.2 Qualification-related human resource management

Human resources for a qualification management are required for ensuring a work performance by qualified workers at all times. Items for this human resource management include items regarding a recruiting process and a qualification of workers. Guidelines for a qualification management of individuals and departmental staffs, guidelines for recruiting and an allocation of workers, guidelines for training (including re-training) to maintain qualifications will be developed in this scope.

2.3 Training-related human resource management

Items of human resources for a training and education management will include guidelines for a training and education to maintain or improve a workers' competence, guidelines for a SAT (Systematic Approach to Training) implementation and assessment which include the management of an simulator training.

Details of human resource management items can be listed as in Table 1.

Table 1. Details of human resource management items

#	Category	Contents
1	Working time	Suitable working time, overtime, rest time, commuting time
2	Working attitude	Off-day, holiday, taking over the duty
3	Abnormal condition	Management of abnormal and emergency
4	Shift work	Guideline, schedule
5	Transition	Job transition
6	Responsibility of transition	Hand over, absence
7	A health (medical) Examination	First examination
8	Additional examination	Detailed medical examination
9	Epidemiological examination	Solution
10	Assessment of physical environment	Procedure and guideline of physical environment
11	Mental health, drug abuse	Operator
12	Improvement of health	Duty of employer
13	Musculo-Skeletal disorders	Weight lifting, hazard analysis
14	Cardio-vascular and cerebro-vascular accident	Management of health
15	Job Stress	Management of job condition
16	Accident prevention	Accident safety
17	Fire, emergency	Fire protection
18	Protection tools	Verification of human error, check
19	Warning post	Extraneous[sticked] matter, symbol
20	Recruit	Existence and observance of criteria for recruit
21	Maintenance Qualification	Qualification condition, Completion of essential training for qualification
22	Maintenance specialty, Know-how	Application content of employee's know-how and human errors
23	SAT	Systematic training program Safety culture training program particularly for management staff
24	Safety culture	Simulator training program
25	Training program using simulator	Simulator fidelity
26	Propriety of simulator	Cooperator training program
27	Training for cooperator	

3. Discussion and Conclusion

The management of human resources may be influenced by company policies, standard technical administration procedures, plant management procedures, and site job guides. At present, a considerable portion of a management job is computerized due to the introduction of ERP (Enterprise Resource Planning). Many human resource management tasks in relation to working hours, education, and general affairs can be handled through the ERP system. A human resource management as a part of the HFMP should be in good harmony with the overall management system. The guidelines for human resource managements should be developed in consideration of corporation strategies and the characteristics of a specific NPP, i.e., not only technical

aspects of human factors but also managerial aspects of a long term plant operation and management should be considered in the development. The LCM (Life Cycle Management) should be applied for a removal of bottlenecks by new emerging technologies and a continuous improvement of a management program. Figure 2 shows an example of a LCM application to a shift work management.

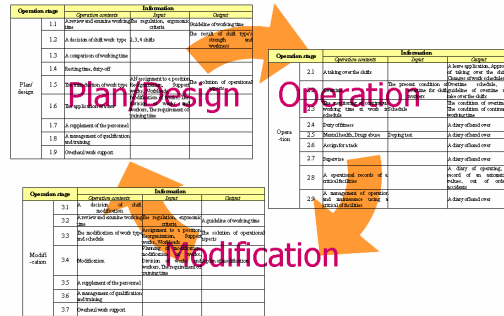


Figure 2. an example of LCM(shiftwork management)

Until now, human resource management in industries or NPPs is acknowledged as an indirect supporting functions. However, the ISO(International Standard Organization) 18000 which is a system for an integral management of a workplace safety, the SMS(Safety Management System) by the FAA(Federal Aviation Administration), and the EAPs(Employee Assistance Programs) which is an integral management system to support workers have brought about desirable results such as an improvement of a job productivity, ensuring human resources, securing a safety, and the improvement of a workers' welfare and health. For a more active and direct management of human resources through the HFMP, the program should be developed in a form by integrating the management factors.

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