

Current Status of Management of Human Resource for Enhancement of Radiation Safety

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1. Introduction

According to the emerging change on national energy transition policy in the Republic of Korea, the interest on radiation safety of domestic nuclear field has been increased [1]. Not only change of the governmental energy policy consulted by foreign nuclear phase-out policy such as Germany and Belgium, but social impact from Fukushima Daiichi accident and, recent earthquake which occurred in Gyeongju and Pohang had led reinforcement of public opinion to radiation safety as the safety of nuclear power plants and related facilities. In response, it is crucial to identify the competence of human resource (HR) that could contribute to safety of radiation facility. Full scale enumeration on nuclear engineering related academic and research area had been pre-studied. However, despite of the importance, specific survey on radiation safety related field, which could identify the HR balance between supply and demand has not been initiated. The present survey analysis research is aimed to estimate expectation of human resource supply and demand on KAERI, KINS, KINAC and KHNP Central Research Institute so as to evaluate its balance status for long term stable HR management for ensuring and enhancing the radiation safety.

2. Methods

2.1 Research Scope

Detailed research objects are analyzing radiation safety, which covers the area from controlling reactor safety to manage related sites as regulated supply and demand of human resource and assessment of sustainable and practical method for continuous human resource. To analyze the enumerated human resource data, the field of academic nuclear engineering has been classified into seven parts in order to identify, which enables the identifying radiation safety related human resource.

2.2 Expert Supply Status in the Field of Radiation Safety

For specification of the supply of radiation safety management professional HR, the academic field of nuclear engineering had been classified into reactor physics, thermal hydraulics, radiation, nuclear material, instrumentation control chemistry control, and etc. [2]. As shown in Table 1, the database

constructed by survey in the 16 universities represented, total number of 844. In terms of academic background, radiation field was surveyed, the highest increasing with 111 followed by etc. as 90 people, which indicates interest of pre-professional human resources to radiation safety are increasing.

In the field of research and industry, researchers positioned on radiation safety are 783, respectively as 30% out of total number of 2587 people that professional HR working for KAERI, KINS, KINAC and KHNP Central Research Institute as shown in Table 2.

Table 1. Change of human resources in domestic universities

Field	2018 year	2017 year	Change
Reactor Physics	115	83	32
Thermal Hydraulics	169	156	13
Radiation	150	39	111
Nuclear Material	103	89	14
Instrumentation and Control	70	26	44
Chemistry Control	39	35	4
Etc.	198	108	90
Total	844	536	308

Table 2. Status of human resources in the area of research and industry

Institute	No. of Researchers	Radiation Safety Area	No. of Researchers
KAERI	1452	Radiation Safety Researcher	56
KINAC	96	All	96
KINS	524	All	524
KHNP Central Research Institute	515	Safety Assessment	25
		System Safety	30
		Safety Technology	52
Total	2587	N/A	783

2.3 Expert Demand Status in the Field of Radiation Safety

Research and management of radiation safety is being carried out mainly in KAERI and KINS. Expected demand for the human resource was cited from pre-initiated research [1, 3, 4], which was initiated based on 4th and 8th basic plan for long-term electricity supply and demand and the data was

evaluated with human resource from 2018 on the related organizations. In addition, HR supply analysis based on the 8th basic plan for long-term electricity supply and demand, which is the most recent program, was also initiated with top-down method. The reliability evaluation of the KAERI and KINS radiation safety management experts demand data was done by comparing with current human resource full scale enumeration result [1].

3. Results

KAERI in 2018, total researchers showed 47 people less and 115 people larger compared with 4th and 8th basic plan for long-term electricity supply and demand respectively. In Fig. 1 and 2, the results were cited from previous research [1], which shows expected radiation safety personnel demand on each institution. Radiation safety management experts showed 15 people less and 25 people larger compared with 4th and 8th basic plan for long-term electricity supply and demand.

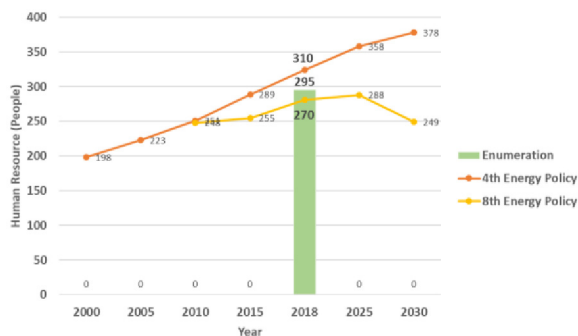


Fig. 1. KAERI Radiation Safety Management HR [1, 3, 4].

KINS in 2018, total researchers showed 137 people less and 39 people larger compared with 4th and 8th electricity plan. In Fig. 2, personnel in radiation safety management showed 3 people less and 38 people larger compared with 4th and 8th basic plan for long-term electricity supply and demand.

The analysis based on 8th demand supply program on energy was done focused on Personnel in radiation safety management on KAERI and KINS, and resulted major difference not larger than 25 and 38 experts, which is respectively, 1% and 7% error out of total 1452 and 524 researchers in KAERI and KINS.

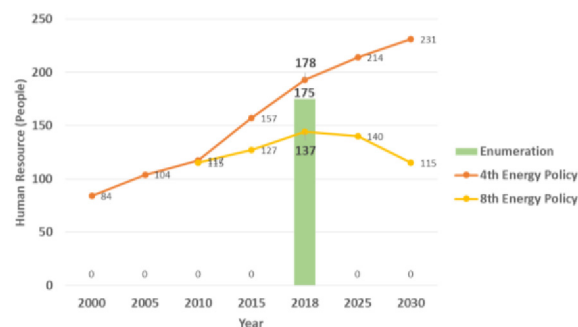


Fig. 2. KINS Radiation Safety Management HR [1, 3, 4].

4. Conclusion

The difference in nuclear power portion between the 4th and 8th basic plan for long-term electricity supply and demand makes difference to the HR supply. Which also leads to decreasing of HR demand from 2025 year both on KAERI and KINS. For keeping continuous balance on supply and demand of radiation safety management human resource which holds key on future radiation safety and public acceptance, it is crucial to make provision on safety of radiation expert demand and supply. Under sudden change on domestic and foreign nuclear industry atmosphere, it is inevitable to experience imbalance on human resource. However, the importance of competitive human resource development on radiation safety to enhance the safety of radiation facility has increased for ensuring public acceptance.

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