

HUMAN RESOURCES CRISIS OF FUTURE JAPANESE NUCLEAR POWER PLANT

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Overview

Commercial operations of nuclear power plants in Japan started in 1970. In fiscal 2006, fifty five plants having the power capacity of approximately 49.5 billion W are in operation, and produced about 303 trillion Wh of electricity, which occupies about 30% of the total electricity consumption of Japan. According to METI's report entitled "Long-term Outlook for the Energy Demand and Supply until 2030", issued in March 2008, at least nine new power plants shall be required until 2030 in order to achieve the energy strategic target of Japan. In fact two plants are under construction now and eleven plants are scheduled to be constructed. If all power plants have been completed, total number of nuclear power plants would be sixty eight, resulting to the expected output of approximate 65 billion W. However "Capital fund" and "Human resources" that could realize METI's scenario are not clarified yet. Objectives of this paper are to clarify the facts of "Human resources," "Technology innovation" and "Operating funds" required for the new and/or aging nuclear power plants in Japan. In conclusion, two remarkable issues were withdrawn, one is the decreasing trend in the number of workers, and another is the distortion of generation structure by occupational category. Concretely, a crisis of human resources might happen ten years later caused by a large amount of retiree, although the number of people might be no problem from the result of the analyze the present state for a while. Moreover, sharp decrease in numbers of "Researchers" and "Designers" should withdraw serious personnel shortage in research and design divisions of nuclear research and development. In order to solve the human resources issues fundamentally, it is necessary the "public acceptance" for the nuclear energy, and the most effective method is to begin with basic energy awareness courses in the elementary and the secondary school education.

This paper consists of the following contents such as, (1) Introduction, (2) Current Status and future scope of nuclear power generation in Japan, (3) Analysis on human resources in the nuclear energy industry, (4) Discussion on Solutions for Human Resources Problems and (5) Summary.

Methods

Investigation and summing up the following documents; (1) Atomic energy policy, (2) Nuclear power human resources development report, (3) Course guideline of study of Ministry of Education, Culture, Sports, Science and Technology, etc.

Results

- (1) Time transition of Japanese nuclear power generation plant according to report of "Nuclear power promotion plan[5]" will shift as : "LWR period" that uses existing light water reactor before 40 years of the assumed longevity, "Maintenance period" that gives aging plants maintenance of plant life extension methods, "Replacement period" that replaces decommissioning LWRs and "FBR (Fast Breeder Reactor) period" that can use uranium fuel very efficiently .
- (2) In order to develop nuclear power generation of Japan in future, it is important to secure a number of talents who have research and development ability and design ability in each age. Present number of talents may be enough to bears "Maintenance period", however a crisis of human resources might happen ten years later. Moreover, sharp decrease in numbers of "Researchers" and "Designers" should withdraw serious personnel shortage in research and design divisions, which should be required for the later "Replacement period" as well as "FBR period" in future.
- (3) The public acceptance for the nuclear energy is one of key factors to the evasion of the human resources crisis of nuclear power generation development in Japan. The most effective method is to begin with basic energy awareness courses in the primary and the secondary school education.

- (4) The nuclear power technology of Japan should greatly contribute to solve the tri-lemma problems relating environment protection, energy security and economic growth in worldwide scale. It is necessary to enhance the environment of human resources that can succeed a technological legend in future era.

Conclusions

More nuclear plants should be required for the solution of energy problems in Japan. However, human resources problem exist in the maintenance of existing nuclear power plants. It is necessary the elementary education and the secondary education as well as academic education in order to solve this issues.

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