An Improvement on the rate calculation method of Nuclear R&D fund

S.S. Kim [a*], M.K. Lee [a], S.W. Yun [a], K.H. Moon [a]
[a]*Nuclear Policy Research Division, Korea Atomic Energy Research Institute, Daejeon, 305-353, Korea*
[*]*Corresponding author: sskim5@kaeri.re.kr*

1. Introduction

Nuclear R&D fund is a share in court which is borne by nuclear industry as a supplementation for the transfer nuclear business in Korea Atomic Energy Research Institute (KAERI) to nuclear industry in 1996. Its main purpose is to invigorate nuclear R&D as well as to support stably the financial resources for nuclear R&D.

The rate of nuclear R&D fund has been being maintained as 1.2 won per kWh from nuclear generation since 1997. Nuclear industry responsible for a levy is changed to Korea Hydro Nuclear Power (KHNP) from Korea Electric Power Corporation (KEPCO) according to an electric industry restructuring in 2001.

Generally speaking, the research and development activities in nuclear field are needing the continuous and long-term perspectives that requires the stable and the large quantity of financial supports. Viewing from the supply side of nuclear R&D fund, the annual amount levied these days appears to be unstable and difficult to predict because the annual nuclear generation is not stable due to the unexpected changes of nuclear policy and regulatory environments. This can consequently make nuclear R&D activities unstable and the growth potential consequently fetched down.

The demand for nuclear R&D shows a continuously increasing trend due to the increase of operating NPPs, the complication & diversification of the surrounding environments related to the whole life cycle of nuclear power operation, and the development of future nuclear technologies.

On the one hand, the performances of nuclear R&D contributed definitely to the localization and efficiency of nuclear power operation as well as construction. This contribution results in continuously the lowering effect of electric tariff through the vitalization of nuclear power in the electric system. That is, nuclear R&D has been considerably contributing to national economy as well as nuclear industry.

The current levy system for nuclear R&D fund is not sufficiently considering the contribution aspects described above. Considering the increase of nuclear R&D fund required and the beneficiary charge principle, it is thought that now is time to review the new kinds of nuclear R&D levy options.

2. Calculation methods and comparison

We tried to find out the available options of lowering the variability of annual nuclear R&D fund by nuclear generation fluctuation and being adaptable to the beneficiary charge principle. In line with the above philosophy, two kinds of options were selected as follows. The first one is the option based on nuclear capacity instead of nuclear generation. This is to estimate the nuclear R&D fund rate on the evidence of the effective nuclear power capacity which means the weighted average capacity considering the network synchronization time of new nuclear power plant in a relevant year. For example, the annual effective nuclear power capacity for 2007 to 2010 was 17,716 MW and those for the year 2011, 2012, and 2013 were respectively 18,516 MW, 19,560 MW, and 20,716 MW. Seeing the variability aspect, nuclear capacity is relatively more stable and predictable than nuclear generation in a specific year. Because nuclear power capacity can be recognized as a benchmark for the market size of nuclear industry, this option seems to be more rational than the existing option from the aspects of stability and beneficiary charge principle. The comparison with the existing option is shown in Fig. 1

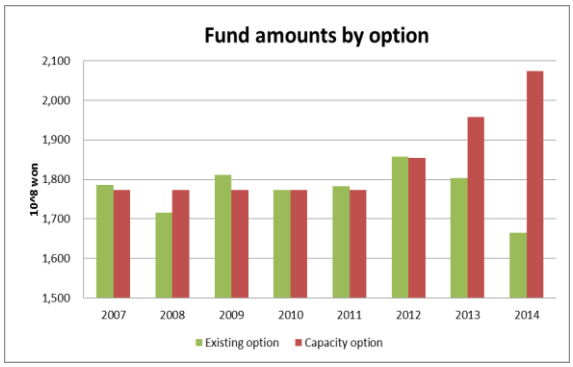

Fig. 1 Comparison between the existing option and the capacity option

The second option selected is the one that is similar to the method adopted in Electric Industrial Foundation Fund(EIFF option). The current EIFF is being levied based on the total revenue by tariff which is influenced by electricity sold and tariff. The EIFF option is expected to be less exposed to the decreasing risk of fund amount and rational in the aspect of the beneficiary charge principle than the existing option because it considers simultaneously the total electricity sold and tariff. The comparison result with the existing option from 2007 to 2013 is shown in Fig. 2.

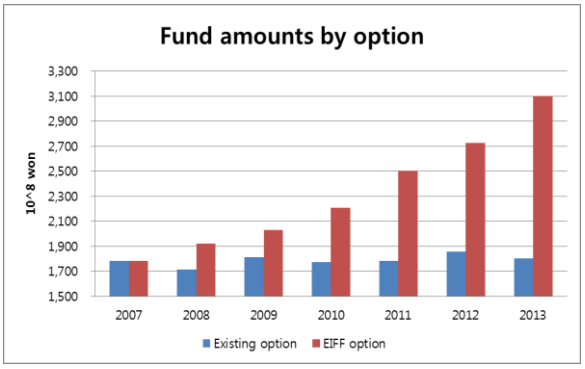

Fig. 2. Comparison between the existing option and the Electricity Industrial Foundation Fund option

3. Conclusions

There is a necessity that the existing nuclear R&D fund system would be revised when considering the continuous increase of nuclear R&D activities to be tackled and the beneficiary charge principle. Focusing on the stability of fund and the beneficiary charge, two options besides the existing option are analyzed. The result of analysis through the past data shows that the current levy system is thought to have been irrational judging from the adoption of the rational charge standards.

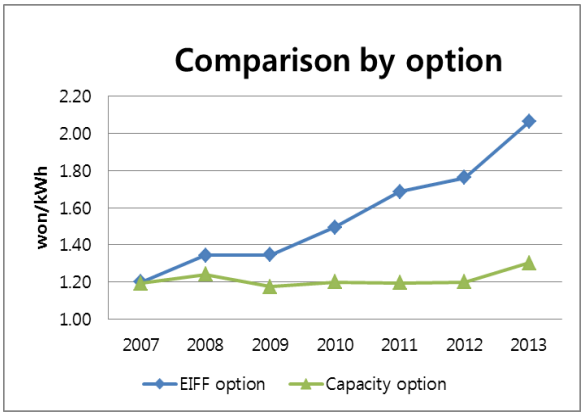

Fig. 3. Comparison between the capacity option and the Electricity Industrial Foundation Fund option

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