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Economical Investigation of Nuclear Desalination in Akkuyu Nuclear Power Plant

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ABSTRACT

Increasing population and developing technology both cause environmental pollution, which along with wrong agricultural irrigation and global warming are threatening fresh water resources. Because of this, fresh water production by using desalination facilities is getting popular nowadays. Thermal cycle electricity facilities such as nuclear, coal, oil and gas plants can produce fresh water with electricity by using desalination. Currently, working on this type of facilities is getting important. Nuclear desalination systems can provide cheap and sustainable energy with fresh water to various countries.
In this work economical investigation was performed for nuclear desalination facilities that work with VVER 1200 nuclear reactor, which is the first Turkey nuclear power plant now under construction in Mersin, Akkuyu. To achieve this working, Desalination Economic Evaluation Program (DEEP) which was developed by International Atomic Energy Agency (IAEA) was used. DEEP software makes economic analysis of desalination systems with working thermal cycle electricity plants such as nuclear, coal, oil and gas plants. VVER 1200 data were obtained from IAEA data base and environmental data for Mersin Akkuyu were used for analysis. Then analysis for variable desalination technologies with variable production rates to evaluate ideal results were performed.
Results of economic analysis for Mersin, Akkuyu nuclear desalination plant working with VVER 1200 reactor, ideal desalination technology and production rate were investigated. With these results electricity demand and price with fresh water demand and price in Turkey to understand desalination plant is suitable for Turkey were determined.

Keywords: Akkuyu Nuclear Power Plant, desalination, DEEP

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