

Nuclear desalination: A viable option of the future based on existing experience

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ABSTRACT

Seawater desalination using nuclear energy is a viable option to meet the growing demand of potable water. This paper summarizes experience on nuclear desalination in member states and recent activities conducted by the IAEA. Over 200 reactor-years of operating experience of nuclear desalination have been accumulated worldwide. Experience also has been accumulated through current nuclear demonstrated projects such as the Indian Kalpakkam plant (6,300 m³/d hybrid RO-MSF plant coupled to a pressurized heavy water reactor (PHWR)), and Pakistani plant (4,800 m³/d MED coupled to a PHWR and has been commissioned early in 2010). These demonstration projects aimed to confirm the technical and economic viability of nuclear desalination under country specific conditions. All projects have demonstrated excellent operational performance, high reliability and safety producing high quality water at competitive costs. An overview of the economic benefits of nuclear desalination is highlighted. Recent case studies conducted under an IAEA coordinated research programme have revealed that nuclear desalination should be considered as a real option to meet the water needs and shortages in the water scarce areas. Yet, the main challenge for the large-scale deployment of nuclear seawater desalination is the lack of infrastructure and resources in the countries affected by water scarcity problems which are however, interested in adoption of nuclear desalination for the sustainable water resource. A summary of the IAEA activities on seawater desalination using nuclear energy is presented.

Keywords: Nuclear desalination; Existing experience; Economics; Nuclear energy; IAEA activities

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