



Decanter system as mechanical treatment for enhancing seawater feed quality at Sabiya power generation and water desalination plant

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ABSTRACT

Long-term performance of power generation and water desalination equipment depends on proper seawater quality. At Sabiya power generation and water desalination plant (SPDP), the seawater quality is very high in turbidity because of high content of silt and sand. Currently, the quality of seawater at SPDP is causing some inconvenience to the operation and maintenance of the station's equipment. This paper is aimed at assessing the viability of enhancing seawater quality for thermal and membrane desalination processes at SPDP using the pilot-scale decanter centrifuge unit as mechanical treatment. This unit has the potential to substantially lower the silt and sand concentration to an acceptable level, allowing the use of seawater safely as feed for membrane and thermal desalination units, as well as for power generation equipment. The experimental results indicated that the decanter centrifuge system is a viable mechanical process for improving the quality of the SPDP seawater feed. The system was able to treat 100% of seawater feed, with a 99.6% availability. The separated silt and sand by the decanter centrifuge unit is coming out as a fine dry powder from the solid side compartment, which can be collected and transferred out of the SPDP station. In addition, the results showed that as flow increases, the power consumption decreases, which give an indication that the power consumption for treating seawater utilizing decanter centrifuge with a bigger capacity will be in an acceptable range.

Keywords: Decanting centrifuge; Silt; Water quality; Turbidity

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