Economic assessment of thermal desalination processes

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ABSTRACT

Cost of desalinated water is a very important factor in evaluating the desalination plant economics and reliability, especially if the plant gets older in operation. The potential increase of shutdown maintenance schedules and reduction of annual production capacity are the major factors because they increase the water cost. This comprehensive study has been carried out to evaluate more than 24 thermal desalination plants in operation in four oil and gas facilities in Libya. Three thermal technologies are mainly used in the oil and gas sector in Libya: multi-stage flashing and multi-effect evaporation with/without thermal vapor compression (MEE/MEE-TVC). Some of these plants have been in operation since the 1960s and few are fairly new. Part of this evaluation study is to estimate the desalinated water cost in Libyan Dinar and US dollar per cubic metre and comparing them to other regions in the world. Cost of desalinated water at four industrial sites has been assisted and the summary is presented in this work. The cost varies, but in some locations, the cost of water is as low as LD 0.5/m³ ($US 0.40).

Keywords: Economic analysis; Desalinated water cost; Multi-stage flashing (MSF); Multi-effect evaporation (MEE); Multi-effect evaporation with thermal vapor compression (MEE/MEE-TVC); Libyan oil and gas sector; LPI

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