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(54) Title: SYSTEM AND METHOD FOR OPERATION OF REVERSE OSMOSIS UNITS

(57) Abstract: In one aspect, the invention provides a RO system comprising an energy recovery device (ERD). The system comprises a water intake pump to provide a feed water; a pre-treatment section to pre-treat the feed water to provide a pre-treated water; a membrane section; an optimizer module to estimate a value for at least one operating variable associated with at least one decision variable, wherein the decision variable is associated with at least one objective constraint; and a control module for operating the RO unit at the estimated value of the at least one operating variable. The RO unit is characterized by a total energy consumed, wherein the energy recovered by ERD impacts the total energy consumed, and the at least one decision variable is selected from a group consisting of flow rate at high pressure pump; pressure at high pressure pump outlet; flow rate at re-circulation pump; pressure of low pressure brine reject stream; or combinations thereof.

