Special Research Study Title	Effect of Axial Deformation on Equilibrium Configuration of Catenary Riser in Sea Water
Special Research Study Credits	6
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Abstract

This special research study presents the effect of axial deformation on equilibrium configuration of catenary risers in sea water. The method of analysis is based on the virtual work formulation which involves the virtual work of the horizontal tension and self-weight of the catenary. The unstrained arc length of the cable is used as the independent variable. The equilibrium position and the axial strain are the unknowns which are solved numerically by using the finite element method and Newton-Raphson iterative process. The model formulation is validated by performing variation of the virtual work expression to obtain the Euler equation, which is identical to the one obtained by the equilibrium equation of a catenary segment. Parametric studies are given to demonstrate the effects of an axial deformation on the equilibrium configurations of catenary riser.

Keywords : Axial deformation/Finite Element Analysis/Steel Catenary Riser/Variation formulation