

A Feasibility Study on Implementing the Energy Piles in Electric Power Industries

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Abstract

The use of energy pile foundations for heat exchanging with the ground has caught significant attention in recent years. One of the potential fields for energy pile application is electric power industries. Implementing the energy piles in electric power industries can be majorly corresponded to two major subgroups, namely "direct applications" in power production facilities and power transmission-distribution networks and "indirect applications" in industrial target consumers. In both categories, some machineries or components need to be cooled or heated to assure proper operation. For heat exchange purposes, commonly a thermal fluid (e.g., water) circulation system is implemented which can be incorporated in energy pile foundations. Among the most important factors, which should be considered to select the energy pile system for heat exchange purposes in industrial machineries, are the magnitude of the flow rate and initial or final temperatures of the geothermal fluids and those corresponded to the operational capacity of the energy pile systems. In this paper, the possibility of direct or indirect usage of energy piles in electric power industries is studied. In this regard, technical aspects of the issue have been considered, analyzed and discussed. Results revealed that there are many principle or auxiliary devices in electric production and transmission-distribution networks or electric consuming industries, which utilize the energy piles for heat exchange purposes. The economical and executional concerns of the issue are discussed, as well.