Abstract

Low conveyance efficiencies causes to reduce of performance of irrigation system and increase water losses. Control and adjust structures of water level can have great impact on increasing of efficiency in the irrigation and drainage canals. Shibab main canal that has been designed in order to irrigate of 23,820 hectares of Sistan plain, has problems in terms of performance, utilization, and management. Prediction of flow situation without using mathematical models is very complicated and sometimes impossible because of the diversity of water structures and operation method in Sistan plain irrigation network, In this research, operation management and performance of existing structures of the shibab irrigation network were evaluated using the hydraulic models of Canalman and HEC-RAS. In this regard, depth and discharge curves were calculated in unsteady flow and were compared in two mentioned models. Then goal function was assessed by using of adequacy and efficiency of discharge delivery indexes. The result of simulation using HEC-RAS model showed that discharge delivery error was equal 0.54 in without control conditions on adjustment structures, whereas this error reduced to 0.42 and 0.357 in conditions with control on adjustment structures in HEC-RAS and Canalman models respectively. On the other hand, the goal function error was equal to 0.52 in conditions with no control on adjustment structures, this error reduced to 0.46 and 0.44 in conditions with control on adjustment structures in HEC-RAS and Canalman models respectively. Despite that the Canalman model shows better results but HEC-RAS is more user-friendly model.

Keywords: irrigation network, non-permanent flow, Control and adjustment structures, Canalman, HEC-RAS, adequacy and efficiency indexes, Shibab

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