

Vich Sriwongsa 2008: Development of Low-Cost Canal Automation System.
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Development of low – cost canal automation system aims to control water level in canal at target level. The development is divided in 2 steps. Firstly, canal automation model development, the model was constructed and tested in laboratory by combined automatic centralized and localized control by using embedded system, call robogate. It controls upstream water level of the regulator. The result shows that error water levels are in the range 1.22-2.83 %. The second step was the developing of Kamphaengsaen and the Songpeenong canal automation systems. The case of Kamphaengsaen canal automation system used irrigation canal in Kasetsart University Kamphaengsaen campus. The canal system comprises of a main canal (MC) and lateral (1L-MC). The robogates were installed at MC km.0+725 and L-MC km.1+200 to control the upstream target level. Telemetering stations were installed at MC km.2+175 and 1L-MC km.2+500 to monitor water level at the tail of canal. The automatic centralized control was used for gate opening at MC km.0+000 and 1L-MC km.0+000 and the water level in the canal was controlled at the target level with RMSE ranging between 0.013-0.029 m. which are lower than that of the manual controlled of 0.118-0.295 m. The reliability of the measured and transmitted data to the master station 88.67 % by radio wave. The case of Songpeenong canal automation system was tested at Songpeenong Irrigation project, Suphanburi. The robogate were installed at cross regulators of 5L-2L canal km.3+650, 9+813 and 20+300 to localized the upstream at target water level. The master station was automatically centralized control the discharge at head gate of 5L-2L km.0+000. The automatic mode showed the better result with a lower RMSE of 0.178-0.319 m. comparing to the RMSE of 0.427-0.551 for the manual control. The reliability of the measured and transmitted data to the master station 86.66 % by VHF radio wave.

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Thesis Advisor's signature

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