

Banleu Radagan 2009: An Improvement of Residential Water Pump Performance for Supporting Fire Suppression. Master of Engineering (Fire Protection Engineering), Major Field: Fire Protection Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Lertchai Ratanaaporn, M.Eng. 74 pages.

Fires are dangerous causing many damaging results. Those damages include the loss of life, property, and the environment. It also wastes a lot of time to fix and recover the damaged property. The NFPA journal of 2008 recorded that 81% of the fires result in lose of life from house fires including homes, houses, apartments, and hotels. The purpose of this research was to study and improve the residential water pumps to support fire suppression in home sprinkler systems.

In this research, tests were done to find the performance of residential water pumps at 300 watts and a frequency of 50 Hz at 1,450 rpm. The test results showed that the pressure and flow rate of the water did not meet NFPA 13R standards. The standards are set at 14.8 psi and a flow rate of 49 L/min as a minimum requirement per sprinkler. Therefore, the performance of the residential water pump needed to be increased. The research concerning the theory of the pump affinity laws showed that the flow rate and pressure vary with the impeller speed. From the test, when the frequency was increased to 71 Hz at the speed of 2,111 rpm, the residential water pump built a sufficient head and flow rate that met the standards for fire suppression use. With this performance, the residential water pump was above the standard requirements.

The results of the thesis shows that the 300 watts residential water pump can be used for fire suppression with a high efficiency. It also meets the water based sprinkler system standards for residential use when increase the frequency to 71 Hz.

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Thesis Advisor's signature

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