

A Steam Generator Water Level Controller Using a Receding Horizon Control Method

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Abstract

In this work, this receding horizon control method was used to control the water level of nuclear steam generators and applied to a linear model and also a nonlinear model of steam generators. A receding horizon control method is to solve an optimization problem for finite future steps at current time and to implement the first optimal control input as the current control input. The procedure is then repeated at each subsequent instant. The dynamics of steam generators are very different according to power levels. The receding horizon controller was designed by using a reduced linear steam generator model fixed over a certain power range. The proposed controller designed at a fixed power level showed good performance for any other power level within this power range. The steam generator shows actually nonlinear characteristics. Therefore, the proposed algorithm was implemented for a nonlinear model of the nuclear steam generator to verify its real performance and also, showed good responses.