## Economic dispatch using fuzzy logic

### Abstract

A Fuzzy logic based solution for emission constraint economic dispatch is demonstrated in this work. The aim of this work is to minimize the fuel cost of operation of an interconnected power system with emission constraints. This non-linear constrained multi-object optimization solution has been solved by other investigator using AI computation methods. These solutions though provided a global optimal value, are not suitable for computer implementation, due to computational complexity and large computation time.

Fuzzy logic has served a black box modeling tool for engineers in application where no proper mathematical models are available. In the first phase of the work various fuzzy based models are investigated to see how they can model the nonlinearities in the generator cost equation. On intensive testing it was found that the fuzzy based model with two inputs the error and change in error was able to attain the optimal solution with highly reduced computational time, Compared to methods like simulated annealing. Five membership functions were defined for error and change in error which resulted in a rule a rule base with twenty five rules. The error and change in error were represented with various possible membership function among them the triangular membership was chosen by trial and error method. The defuzzification method chosen was centriod method.

Results for a three generator test system have been presented to validate the proposed method. Hence this method may be used in place where a combined ECEDP is necessary.

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