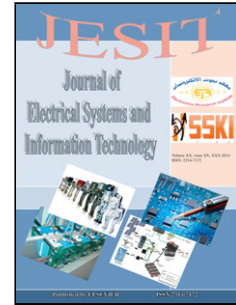


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Improved Real Coded Genetic Algorithm for Dynamic Economic Dispatch

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Abstract: This paper develops and recommends improved real coded genetic algorithm (IRCGA) for dynamic economic dispatch problem. Genetic algorithm (GA) is a bunch of evolutionary algorithms root of the human heritable chromosome operation and has the ability to ascertain the global optimal solutions. In this paper, IRCGA has been suggested to heighten convergence speed and solution quality. The efficacy of the suggested technique has been confirmed on two test systems and 15 benchmark functions. Results of two test systems and 15 benchmark functions acquired from the developed IRCGA have been matched up to those achieved by real coded genetic algorithm (RCGA). It has been observed from the comparison that the suggested IRCGA technique has the ability to endow with superior solution.

Keywords: Improved real coded genetic algorithm, dynamic economic dispatch, ramp rate limits

List of symbols

P_{it}	real power output of i th unit during time interval t
P_i^{\min}, P_i^{\max}	lower and upper generation limits of i th unit
P_{Dt}	load demand at the time interval t
P_{Lt}	transmission line losses at time t
a_i, b_i, c_i, d_i, e_i	cost coefficients of i th unit
$F_{it}(P_{it})$	cost of producing real power output P_{it} at time t
UR_i, DR_i	ramp-up and ramp-down rate limits of the i th generator
N	number of generating units
T	number of intervals in the scheduled horizon

1. Introduction

Static economic dispatch (SED) allocates the load demand for a given interval of time among the committed generating units economically while fulfilling various constraints. Dynamic economic dispatch (DED) which is an extension of static economic dispatch, determines the optimal sharing of time varying load demand among the committed units. Power plant operators try to keep gradients for temperature and pressure inside the boiler and turbine within safe limits to avoid shortening the life of the equipments. This mechanical constraint imposes limit on the rate of increase or decrease of the electrical power output. This limit is called ramp rate limit which differentiates DED from SED problem. Thus, in DED the dispatch decision at one time period affects those at later time periods. DED is the most accurate formulation of the economic dispatch problem but it is

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