QUADRATIC AND EXPONENTIAL COST FUNCTION IN ECONOMIC LOAD DISPATCH OF THERMAL POWER PLANTS: A COMPARISON

Mohammad Mohatram[1], Praveen Dhyani[2], Peeyush Tewari[2]
1Waljat Colleges of Applied Sciences, Muscat, Oman with Birla Institute of Technology, Mesra, Ranchi, India, Email: mmohtram20@gmail.com
2 Birla Institute of Technology, with Royal College of Applied Science & Technology, Ras Al Khaimah, UAE, email: dhyani_p@yahoo.com, academic@biticrak.ae

ABSTRACT

In this paper the problem of Economic Load Dispatch (ELD) in power systems is solved by considering the operating cost of a thermal power plant as a quadratic and exponential function. Equality constraints of power balance and inequality plant generation capacity constraints are taken into consideration. The problem is solved by the Lagrangian approach of equal incremental cost. The problem is tested for two power systems consisting of two units and six units of generators. The results obtained by considering the cost functions as quadratic and exponential are comparable. The time taken to execute the results with exponential cost function is less compared to the time taken with quadratic cost function. Therefore, it may be considered as a replacement for the conventional practices presently being used in different central load dispatch centers across the globe.

KEYWORDS: Economic Load Dispatch, Quadratic Cost Function, Exponential Cost Function, Lagrangian Approach.