Voltage Drop Compensation in Long Tunnel Driller and On-Line Parameter Estimation

Abstract

In order to increase the efficiency of desired work inside the long tunnel drilling, rating of electrical drives at tunnel face has significantly increased. Due to the high rating concentration of electrical drives at tunnel face significant voltage must be required which is need of an hour to finish the work in given time interval and to avoid the various dangers. Therefore, planning of electrical power distribution is required and voltage drop across each electrical drives must be taken into account. While power planning drill machine, Armored Face Conveyors (AFC), Shearer, breaker, Stage loader, face lightning, etc. must be given due importance as starting power required to them is very high. Breakaway torque of the AFC is not maintained because of low power, so it is required to start constantly requiring high power as well as it will heat the
environment, which is often hazardous. In order to provide the required power drop and reduce
the dangers, some alternative methods must be used. In the present investigation voltage
drop compensation technique is developed by providing with optimization of position of
transformer. Even though the voltage drop cannot be maintained in such cases boosting
transformer with the power thyristor with tap changing is used to control the power instead of
tap changer mechanism. In order to operate the various drives in long drilling tunnel and finish
the work in desired period one must know the various parameters involved in the system. On
line parameter such as voltage, currents, temperature, etc. of electrical drives and environment
are measured through PC using various sensors, the sensed data is compared with the
standard data. The comparison will help to take necessary decision and helps to reduce the
forth-coming dangers in the tunnel or electrical drives.

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**Index Terms**

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**Keywords**

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