

Azerbaijan State Oil and Industry University
Baku, Azerbaijan

**Determination of parameters of synchronous generators in the
simplified circuit of an electrical system: Mechanical energy
conversion system**

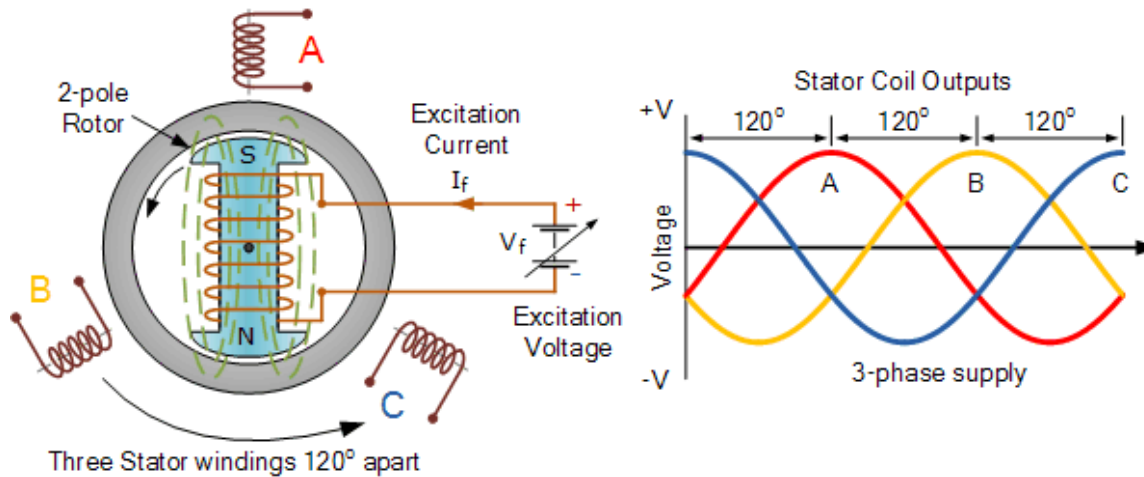
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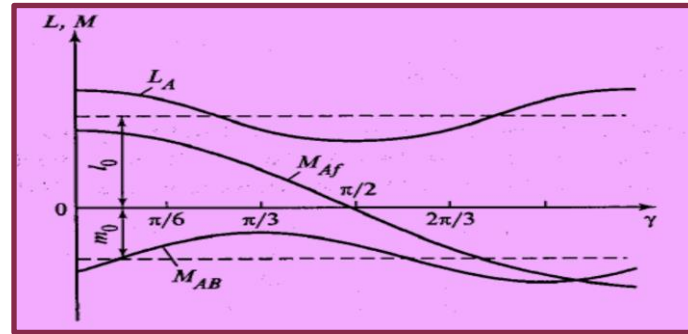
Bucharest, Romania

GENERATOR

Synchronous generators or alternators are used to convert mechanical power derived from steam, gas, or hydraulic-turbine to ac electric power



ABC SYSTEM EQUATIONS OF SYNCHRONOUS GENERATOR



Magnetic flux curves

where U, I, R, ψ -are respectively voltage, current, active resistance, flow coupling;

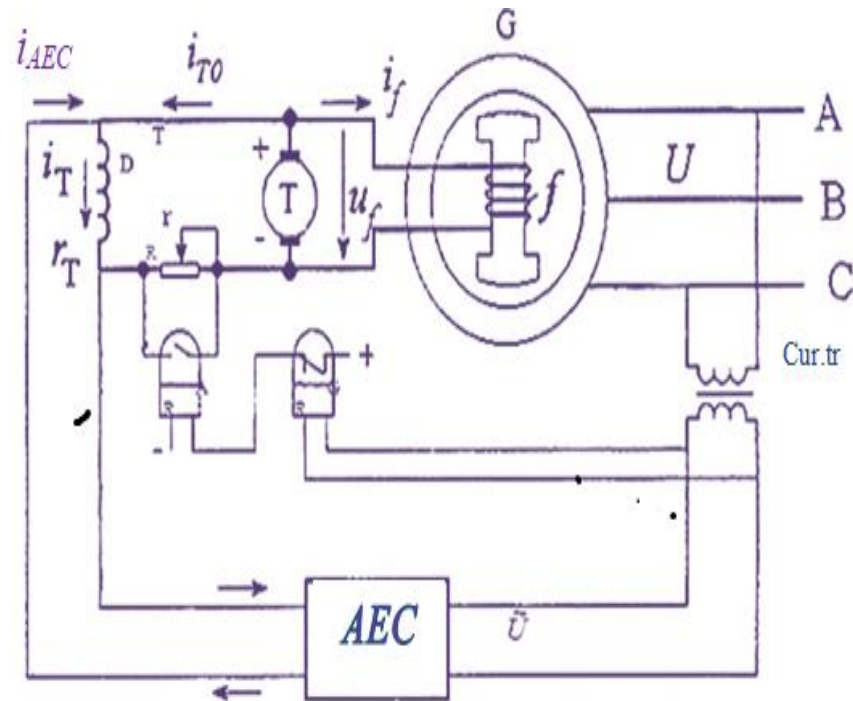
L, M – coefficients of self-induction and mutual induction; A,B,C designation of the stator windings of the corresponding phases; f - index of the values of the excitation winding;

t - time.

$$\begin{bmatrix} \psi_A \\ \psi_B \\ \psi_C \\ \psi_f \end{bmatrix} = \begin{bmatrix} L_A & M_{AB} & M_{AC} & M_{Af} \\ M_{BA} & L_B & M_{BC} & M_{Bf} \\ M_{CA} & M_{CB} & L_C & M_{Cf} \\ M_{fA} & M_{fB} & M_{fC} & L_f \end{bmatrix} \times \begin{bmatrix} I_A \\ I_B \\ I_C \\ I_f \end{bmatrix},$$

AUTOMATIC EXPOSURE CONTROL (AEC)

When creating these methods, it is important to determine the parameters of the mathematical models of SGs themselves and their control devices (automatic exposure control - AEC, automatic speed control device for rotation speed of the rotor of SGs - ASC). However, the determination of the parameters of automatic control devices of SGs is based on general ideas, which in some cases do not correspond to real conditions at all. Thus, we believe that the calculation of the equivalent parameters of automatic control devices (AEC and ASC) of SGs remains an actual problem and requires more extensive research and studies.



THANKS FOR YOUR ATTENTION!