

# TERMS SUSTAINABLE COLLABORATION HETEROGENEOUS ASYNCHRONOUS MACHINE IN AN AUTONOMOUS ELECTROMECHANICAL COMPLEX

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*To ensure stable conditions of the established heterogeneous asynchronous generator and engine power commensurate offline proposed distribution of complex electromechanical excitation volume machines on individual branches of the circuit, unrelated conditions ferorezonansu stress.*

***Standalone Electromechanical complex, asynchronous generator asynchronous motor, capacitor excitation ferorezonans stress resistance circuit magnetization.***

Autonomous electromechanical system (AES) is partial variant battery power system with electric cars as a source and consumer of electricity. The source of electricity in this sector is a synchronous generator (SG) and the main consumer - the asynchronous motor (AM) with cage rotor. However, combining in a single AES structurally complex and expensive SG with a simple and cheap blood pressure does not meet the same degree of reliability of individual machines in the electromechanical sector.

The purpose of research – for example, calculation and analysis of the characteristics of the physical model of autonomous complex electromechanical consider possibilities and conditions of operation of asynchronous generator and engine power commensurate with different variants of capacitive generator excitation (Fig. 1).

Research Methodology. For an objective comparative evaluation of results of calculation for all model variants chosen your blood pressure 4A71A2 capacity pH = 0.75 kW and only basic machine for all variants AG is a serial AM 4A71V2 power

$P_n = 1.1$  kW. The coefficient of proportionality basic nominal power of AD and AAH as offline conjunction with SG and AD adopted 0.7 [4]. Selection Series 4A reasonably basic machine availability weekend parametric data AM [5].

Due to the short duration transient electromagnetic compared to electromechanical processes calculation launchers and machine performance AES permissible conduct in kvaziustalenomu process.

The cause of resonance phenomena in the circle phase AES are the only excitement for their capacity  $C$ , which together with a working engine creates external active-capacitive resistance against the active-inductive resistance generator.

Means of struggle against negative phenomenon in ferorezonansu AES can serve as a way of distribution circuits capacitive excitation of an asynchronous generator and motor on separate branches of electric range complex that unrelated conditions resonance voltages. In particular by limiting the role of external excitation capacitance  $C$  only working engine, that is his full compensation of reactive power, their overall resistance will only be active. But this generator should have its own independent excitation, for example, internal capacitive excitation.

This condition corresponds compensated autonomous asynchronous generator (CAAG) and fully meets its generalized modification with internal capacitive excitation [8].

CAAG performed on the basis of the same batch of three-phase squirrel cage AM that AAH, without changing its design. This phase stator winding its zone 60o divided into two equal parts by the number of revolutions of their spatial displacement in the grooves of the stator winding relative to each other at 30 degrees and inclusion scheme rotary autotransformer (AT) on the internal electricity capacity  $S\Delta$  (Fig. 1b) .

CAAG DR comparable power and steady work in steady state at nominal load. Internal capacity  $S\Delta$  does not provide full CAAG excitement and plays only a supporting role in increasing the degree of rigidity of its external characteristics. The bulk of excitement and full of excitement CAAG working AD provided external capacity  $C$ . This maintains the character capacitive reactive impedance component and engine capacity. Therefore, when you start working on a large capacity engine  $C$ -

autonomous system CAAG DR as for AAH, remains a risk of breach of ferorezonansu and stable operation. To address these phenomena need during start and acceleration of the engine working to strengthen its external and internal excitation excitement CAAG that is similar to the synchronous generator (SG) to speeding up the excitement.

This reliability provides:

- Distribution of containers excitement for AM into three parts with their location in some branches of the circuit AES;
- Reducing the capacity of the external ring generator and limit its role only excitement of the engine;
- Full self-excitation of the generator by the internal capacitive compensation, mainly due to the additional shunt winding capacity, than forcing excitation in AEK during start AD.

### **Conclusions**

Unlike other stand-alone systems with only complex CAAG AM + AM appears in employable modes start and acceleration DR singing shutters with generator power. Such a start is made in the 3.4 fold increase in total capacity excitement compared to its value for normal operation. To avoid overstimulation and the emergence of a surge during acceleration AEK AD should switch capacitors for example, considered a variant of CAAG + AD CS / HSΔ / HSk = 55/70/70 ohms at + CAAG version of AD CS / HSΔ = 180 / 70 ohms. That is a change from the excitement of the total capacity of about 3 times, while in combination with AAH + AD during start DR comparable power necessary to increase the capacity of the excitation 5 times. Five fold also accepted forcing excitation during start AD, which receives power from the SG.

Further development of AEK AM can be obtained by replacing serial AD compensated for induction motors (KAD) [7] with high starting torque, reduced operating current and high power factor.

For simplicity of design, reliably and cost of compensated AM AEK can be a worthy competitor to the classic autonomous complexes SG + AD.