

Figure 3. The model of the test bench built in MATLAB/Simulink.

УДК 621.38

AUTOMATED CONTROL SYSTEM FOR THE TECHNOLOGICAL PROCESS OF A TURBINE UNIT

Madduma Patabendige Sadick Ranjith

Scientific supervisor — DUBININ S.V., assistant professor

The main goal of the diploma project is to develop an automated control system for the technological process of a turbine unit.

To achieve this goal, it is necessary to solve the following tasks:

- characterize the automation object;
- study the goals and requirements for the development of an automated process control system for a turbine unit;
- select specific equipment on the basis of which the automated process control system will be built and describe its capabilities;
- develop a block diagram of an automated process control system

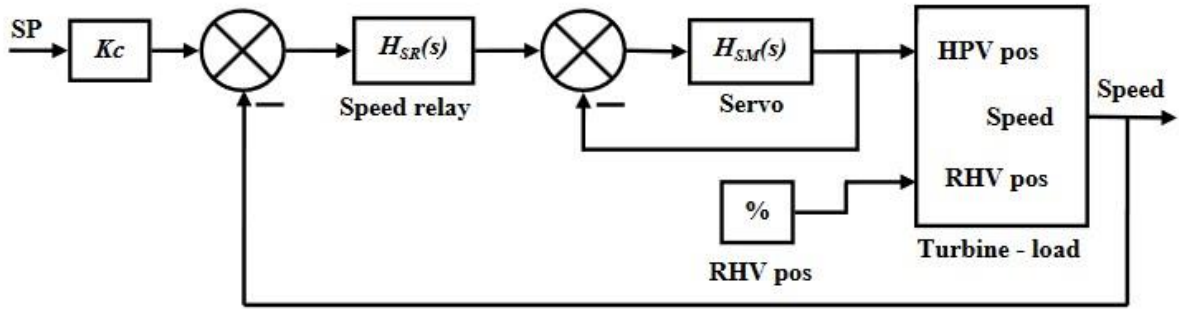


Figure 1 – Simulink block diagram with control system

The technological control object is a turbine unit;

Steam turbine type PT-60-130/13 – condensing, with two adjustable steam extractions. Rated power 60 MW at 3000 rpm. The turbine is designed directly to drive an alternating current generator of the TVF-63-2 type with a power of 63 MW.

The share of electricity generated by the automated turbine unit PT-60-130/13 with the generator TVF-63 (TG-1) is 40%.

The Control system consists of a combination of two separate objects:

A TEKON MFK3000 controller unit and an Arduino Uno Rev. 3 microprocessor board. The Arduino Uno is connected to the control unit to provide control instructions and also is connected to the necessary sensors to acquire the necessary readings.

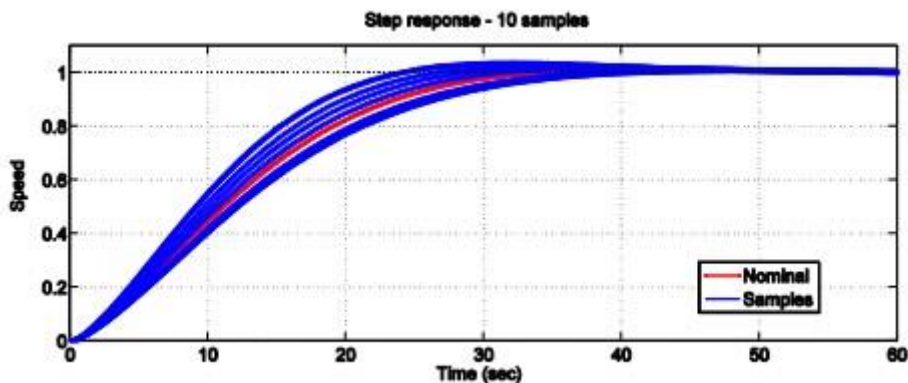


Figure 2 – Speed variation, obtained to variable load.

Literature

- [1]. Still, U. and Zorner, W. (1996) *Steam Turbine Generators Process Control and Diagnostics*. Berlin: Siemens Aktiengesellschaft, Berlin and Munich.
- [2]. Bloch, H. P. and Singh, M. P. (2009) *Steam Turbines Design, Applications and Re-Rating (Second ed)*. New York: McGraw Hill