vice model are: the organization of IT departments, information resources and processes, IT policies and procedures.

Modern business systems have passed three stages of development. At the first stage, a quality management system is created (according to the requirements of ISO 9001), IT processes necessary to support business processes are established, requirements for information security, investment management in IT are defined. The production processes for the provision of IT services meet the requirements of ISO 20000-1.

According to the concept of the Capability Maturity Model Integration (CMMI) model of methodologies for improving processes in organizations, IT services are both a process and a product. Each separate IT service is based on a standard IT process and requires Tailoring to the needs and specificity of the client, as a result of which there is a service IT process for a particular client and a basic version (Baseline) of the officially approved configuration status. There are six main stages in the introduction of CMMI concepts into the IT service model.

References

1. Chong, A.Y.L., Ooi, K.B., Lin, B.S. and Raman, M. (2009) Factors affecting the adoption level of c-commerce: An empirical study, "Journal of Computer Information Systems", Vol. 50, No. 2, pp 13-22.
2. Cooper, R.B. and Zmud, R.W. (1990) Information technology implementation research - a technological diffusion approach, "Management Science", Vol. 36, No. 2, pp 123-139.
3. Davis, F.D. (1986) A technology acceptance model for empirically testing new end-user information systems: Theory and results, Sloan School of Management, Massachusetts Institute of Technology.

A.O. Komilov

POWER OF NETWORK PHOTOELECTRIC POWER STATIONS

(Ferghana Branch of the Tashkent University of Information Technologies named after Muhammad al - Khorezmi Uzbekistan, Fergana)

The power of the UPS in such systems is selected by the capacity of the redundant load and does not depend on the power of the solar cells. The power of the network inverter can be either more or less than the power of the UPS. To ensure the recovery of the system when the batteries are depleted in the power plant circuit, a small solar battery can be provided, which is connected to the AB through the charge controller (shown in dotted lines). If the interruptions are short-lived, then these elements can not be used.

The most universal are photovoltaic systems with a network inverter at the output of the UPS. Fig.1. In this scheme, power plant construction also uses a high-

efficiency network inverter, but unlike the previous scheme, in the absence of voltage network solar panels continue to feed the redundant load and charge the batteries.

In normal mode, if there is a voltage in the network, the network inverter supplies the terrain with redundant load, while the conversion efficiency of the inverter is very high - more than 90-95%. If the load consumes less than the solar panels produce, the excess energy goes to the charge of the batteries. If the load consumes more - then the missing energy is taken from the network. After the batteries are fully charged, the surplus energy is sent to the general one and feeds the rest of the load.

In the event of a power failure, the UPS switches to battery operation, and simultaneously provides a reference voltage for the network inverter. Because the energy of the sun continues to be used and in case of accidents in the networks. As with a network, surplus solar electricity is sent to the battery charge.

If the mains voltage is not lost, but has exceeded the permissible limits, the inverter is disconnected from such a network and continues to supply the critical load with a high-quality current - from the SAT and from the AB. The load connected to the inverter is powered by the voltage that is in the network.

Advantages of the system is the effective use of batteries (operation in the buffer mode), the effective use of renewable solar energy, possible recovery in the case of deep battery discharge, using a small SAT connected to the AB through the charge controller (roll by the dotted line).

The disadvantages include the need to use special hybrid autonomous inverters, which can charge AB from the output, and direct excess solar energy in there. Such an inverter must either give a signal to turn off the mains inverter, or increase the output frequency to control the network inverter (most network inverters stop working when the frequency parameters exceed the specified limits). To build such systems, inverter models are required that provide the above functions, for example, Steca Xtender XTN / CTM, SMA Sunny Island. Xantrex XW, RichElectric CombiPlus and others.

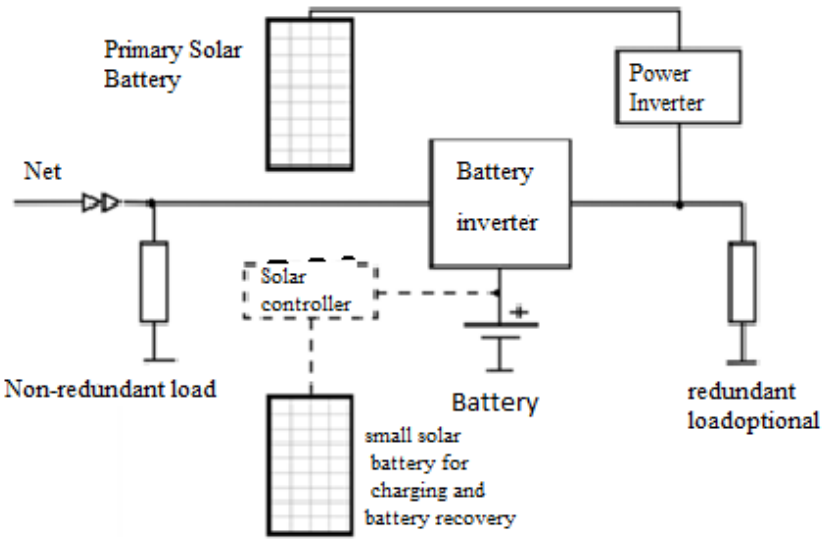

Fig.1. Network photoelectric power supply system with a network inverter at the UPS input

The performed comparative analysis of FES construction schemes shows that the application of network inverters and switching circuits shown in most cases increases the efficiency of the system, especially if most of the solar energy is consumed in daytime. The use of special UPS and the ability to charge AB from the output allows the use of network photoelectric inverters, even during breaks and power supply from a centralized network.

The analysis showed that the schemes of building PV systems are quite diverse and require the use of specialized power equipment. At the same time, the efficiency of the entire energy system will be largely determined by the composition and characteristics of the energy equipment used.

SMA Solar Technology AG [1] is one of the world's leading companies in the development, production and sale of power equipment and devices for building various power supply systems.

SMA technologies, developed using the latest advances in electronics, allow you to maximize efficiency from stand-alone, network and standby power systems based on both traditional and alternative energy sources. As a technological leader. SMA Solar Technology develops and manufactures high-performance inverters from 2 to 1000kW for installations of any size, all power classes and specifications.

The main activity of SMA is the development and manufacture of inverters. The inverter is technically the most important component of any power system in which DC generating plants are used, such as a solar battery, a wind generator, inverter power plants, etc. An inverter-voltage converter is a device that converts direct current to alternating current with specified parameters voltage, frequency). In addition, as an intellectual system, it controls and controls the operation of the entire energy system. SMA inverters are characterized by high efficiency. For example, the inverter developed Sunny Sunny Central, has an efficiency of more than 98%.

SMA offers a variety of inverter models that can be divided into three important characteristics: power, the method of switching on the DC side and the topology of the electrical circuit

An important technical characteristic of inverters is the method of switching on the DC side, which determines the possible options for connecting photoelectric modules with the inverter. This problem is caused by the fact that in many (especially large) photoelectric stations the solar battery can contain several arrays of photovoltaic modules, which have different illumination, and even a different type, and correspondingly, the energy characteristics. To maximize the use of solar energy, SMA has developed special multi-link inverters.

Multi-link inverters have two or more links of inputs, each of which has its own tracker for finding the maximum power point (MPR Tracker). Of special interest is an array of photovoltaic modules with many partial surfaces that are directed in different directions or partially shaded.

The main inverters have only one tracker for maximum power search, despite the higher output power. They are particularly suitable for the day of a large-scale photovoltaic station with a homogeneous array of photovoltaic modules.

From the point of view of the topology of the electrical circuit, it is common to distinguish between single-phase and three-phase inverters, and devices with transformers and beta. In most low-power photovoltaic systems, single-phase inverters are used. However, if the power plant capacity exceeds a certain level, it is necessary to use a system with several single-phase inverters or a three-phase inverter. Thus, the load of the three veils of the distribution network will be balanced.

The transformer serves for galvanic isolation between the photovoltaic system and the distribution grid (which is mandatory in some countries) and allows the grounding of the photoelectric module (a necessary condition for the operation of certain types of photovoltaic modules). Use of transformer inverters is preferable, because they have, as a rule, smaller weight and size indicators, and. in addition, have a high efficiency.

One of the most important tasks of the inverter is to maintain the optimum level of power produced by photovoltaic modules.

Depending on the temperature and intensity of the incident radiation, there is always an exact relationship between the strength of the electric current and the voltage, allowing the photovoltaic module to produce the maximum power. What is also called the maximum power point.

Since the temperature and intensity of the incident radiation are constantly changing (especially with the passage of clouds), the inverter control system must constantly monitor the maximum power point so that the photovoltaic modules produce the largest possible amount of electrical energy. For this purpose, a program called the "Maximum Power Tracker" is used. Multi-link inverters have in their composition several trackers of maximum power, so that differently arranged links work independently.

In addition to the solar battery, the inverter also controls the distribution network to which it is connected. If the output voltage and frequency do not match the set limit values, the photovoltaic power will be disconnected from the mains or the mains will be traversed to ensure safety, depending on the needs of the local network operator. However, if there is a slight increase in frequency, the inverter will accordingly reduce its power to meet the requirements for sept.

In addition, in most cases, almost every SMA inverter has a device that can safely interrupt the current from the photovoltaic modules. Photovoltaic modules function when they are lighted and can not be turned off. Disconnecting the inverter cable during operation can lead to dangerous electrical arcs that do not go out due to direct current.

SMA inverters correspond to the protection class IP65. which allows them to operate in the open air. To cool the electronic components of the device, SMA has developed a specialized and highly reliable OptiCool cooling system.

All models of inverters manufactured by SMA can be divided into two large groups: network and stand-alone (battery).

Network solar inverters SMA are designed for direct connection of photovoltaic modules with an alternating current network. The SUNNY BOY inverter lineup belongs to the network. SUNNY MINI CENTRAL and SUNNY TRIPOWER, which

convert the DC current produced by the solar modules into alternating current, standard frequency and amplitude, and direct it to the line. The SMA network inverters have high efficiency (up to 99%) and are protected by a housing of different operating conditions.

Referdences

1. Lukutin B.V. Surkov M.A. Non-traditional ways of producing electricity. Tutorial. - Tomsk: Izul-in the TPU. 2011. - 193s.

2. Lukutin B.V. Renewable energy in decentralized electricity supply. Monograph. Moscow: Energoatomizdat. 2008. 231s.

3. Lukutin BV Renewable energy sources. Electronic textbook. URL www.lib.tpu.ru/fulltext2/m/2010/01

4. The free encyclopedia. - URL: http: /Wikipedia.org.

A.O. Komilov

ALTERNATIVE SOURCES OF ELECTRICITY PREMIERE IN THE SYSTEMS OF TELECOMMUNICATIONS

(Ferghana Branch of the Tashkent University of Information Technologies named after Muhammad al - Khorezmi Uzbekistan, Fergana)

The modern market is considered one of the most promising in terms of alternative energy in the world.

However, energy efficiency in the country is developing at a slow pace. While a 3-5-kilowatt connection at a remote location with the installation of 40 poles will cost 19 million - the same is an autonomous power station - the consumer often prefers centralized systems. Often the reason for this decision is not the high cost of equipment for a solar power station or the reluctance to mess with documents, and the elementary ignorance of the matter.

What do you need to know about an individual solar power plant?

Fig. 1. Advantages and disadvantages of using solar panels