Computer Drawing Method for Operating Characteristic Curve of PV Power Plant Array Unit

Jianbin Tan
Foshan Polytechnic, 528137, China

Abstract: According to the engineering design of large-scale grid-connected photovoltaic power stations and the research and development of many simulation and analysis systems, it is necessary to draw a good computer graphics of the operating characteristic curves of photovoltaic array elements and to propose a good segmentation non-linear interpolation algorithm. In the calculation method, Component performance parameters as the main design basis, the computer can get 5 PV module performances. At the same time, combined with the PV array series and parallel connection, the computer drawing of the performance curve of the PV array unit can be realized. At the same time, the specific data onto the module of PV development software can be calculated, and the good operation of PV array unit can be improved on practical application.

1. Introduction
With the development of science and technology and social progress, in view of the decrease of the cost of PV modules and the adjustment of PV power price, photovoltaic power generation occupies a very large proportion in the energy structure of our country and the utilization of solar energy resources needs to be well improved. Power station management and design for PV power generation jobs. The most important design of large-scale PV power plant is the PV array unit as the basic design. Designers should grasp the different temperature and radiation conditions of the PV array unit in time to improve the operation rationality, take full account of the electrical characteristics of the integrated power plant and economic benefits.

2. Overview of Operational Characteristics of Photovoltaic Power Plant Array Unit
Photovoltaic array unit is mainly due to the PV modules through the series and the combination of installation, with certain structural characteristics of the array bracket, the electrical operation of the photovoltaic array unit, to improve the electrical characteristics of the array bracket and the connection of the components of the combination. Usually, the component connecting factors of the PV modules is the electrical performance of the unit and the radiation intensity of the surface of the PV array unit. The connection needs to be made through the PV modules to improve the electrical utilization of the PV array unit. The performance characteristics of PV array units are mainly determined by the characteristics of PV modules and the relationship between series-parallel connections. Research work on PV models needs to be done. The operation analysis of PV array units is performed. The array characteristic curves are drawn according to the serial-parallel connection between the arrays, and build a good photovoltaic component model to improve the basic parameters of the component analysis [2].
3. Analysis of Mathematic Model of Grid-Connected Photovoltaic Plant

Solar PV grid-connected is mainly for the good use of solar energy, domestic also further improve the PV power plant put into use, for the grid-connected photovoltaic power plant mathematical model needs to be effectively tracked, put forward a photovoltaic array and inverter model, effectively improve the inverter structure Control and Strategy Research. In the operation data, it is necessary to make statistical analysis on the data onto the PV power station and schedule all the departments according to the law of the weather in a timely manner according to the system standby capacity, so as to optimize the effectiveness of the installation mechanism of the pine tree line of the photovoltaic power plant. With the depletion of petrochemical energy and the impact on global warming and haze environmental problems, we need to constantly optimize energy efficiency, change the energy structure and promote the rapid development of energy. According to the modeling of photovoltaic power plants, for photovoltaic modules and grid-connected inverters component analysis, analysis and maintenance of systems engineering, integrated photovoltaic array project to establish the operation of high efficiency. At the same time, the new fluctuation of PV array should be effectively controlled to improve the use of power devices in grid-connected core devices. In view of the lack of rotating parts, voltage regulation and control should be well done, reasonable monitoring and analysis should be conducted according to photovoltaic operating characteristics, and the seasonal variations on PV power plants should be summarized, reasonably adjust some departments to arrange power capacity, improve the design of transmission lines of photovoltaic power plants, save investment, and promote the efficiency of asset utilization [4].

Table 1. Analysis of the electrical performance parameters of the occlusion model verification experiment

| Sample model                        | KC50T-1 |
|-------------------------------------|---------|
| Open circuit voltage VOC/V          | 21.7    |
| Short circuit current LSC/A         | 3.31    |
| The maximum power point voltage Vmmp/A | 17.4    |
| Maximum power point currentImpp/A   | 3.11    |
| The maximum power point power pmpp/w | 54      |
For example, the form of the mask model validation test component electrical performance parameters analysis, grid-connected photovoltaic power plant is mainly due to the photovoltaic array, combiner boxes, inverters and step-up and grid-connected lines composed of grid-connected photovoltaic plant simulation modeling mainly in the photovoltaic, the array inverter and the photovoltaic array can convert the solar energy into electric energy, absorb the solar radiation energy, convert the direct current situation into the alternating current situation, and track the maximum power of the photovoltaic array to improve the voltage frequency phase accuracy of the grid. Based on the PV array and some battery strings in series and parallel, it is necessary to model the PV array, model the PV minimum unit photovoltaic and improve the maintenance of PV array electrical characteristics. At a certain temperature, with the increase of sunlight intensity, the output current and power of photovoltaic array will also increase. According to the light intensity and the output current power characteristics, it is necessary to improve the temperature analysis of photovoltaic lighting conditions.

The output power of photovoltaic array is generally DC, an important component is the inverter. The main function of the inverter is to convert the DC power into AC power through the inverter. At the same time, the harmonic waves of the AC center are cleaned by the filter circuit. Meanwhile, the function of the PV array is controlled, Control the PV grid-connected work according to the inverter topology. Grid inverter is mainly through the maximum power point tracking, and grid control technology is the main issue of the photovoltaic array DC inverter into AC, and then transmission system grid, grid inverter power supply in accordance with the situation in different situations need to increase the voltage source The use of inverters [1].

4. Computer Drawing Method for Operating Characteristic Curve of PV Power Plant Array Unit

In general, the array units of large-scale photovoltaic power stations are relatively large in investment and relatively high in cost. If it is effective to improve the design of low-cost power generation operation curves, it is necessary to continuously optimize the operation efficiency of power plants and the research computer drawing mode, and based on the present situation analysis of photovoltaic array operation modes, operational advantages, improve the level of array unit operation optimization designs. Making full use of computer to draw a scheme suitable for inverter controls of large-scale photovoltaic power plants. Through the modeling, simulation and verification, and photovoltaic conversion efficiency of photovoltaic power plants, the level of photovoltaic power plant array drawing is improved. In the overall capacity of photovoltaic power plants, to improve the layout of polygons, according to sunshine hours, rainy days and terrain elevation analysis, solar power plant in the rich regions of the country to establish photovoltaic array unit, the power plant is generally located in the hilly landforms and gentle landforms. The terrain is generally relatively flat, open and undulating terrain relatively large.

Generally, the power generation unit of a photovoltaic power station includes a solar cell string, a direct current bus connection, an inverter and a boost voltage sett. When the solar cell units are connected to parallel, the dual power supply mode can be adopted in the computer drawing design, mainly for the power supply cited from the nearby power grid, make a reasonable reduction through the outdoor treatment to improve backup power connection, control power automatically switch control work. Project through the set lightning conductor, lightning rod and grounding network connection measures to do a reasonable lightning protection work, the high voltage side of the transformer should be set to metal oxide surge arresters management, while increasing the box-type substation, DC power distribution cabinets and the internal gradually Lightning design. In the curve of the power station duty design can be used computer monitoring system to improve management efficiency, office building design control, through the computer battery array, and network systems and power systems to improve centralized monitoring and management, power station settings to be combined with the computer software system draw, at the same time improve the rational monitoring and management of power plant array system.

The operation mode of PV array needs to be properly optimized. The main factors influencing the
power generation efficiency of PV system is solar radiation degree, solar cell conversion efficiency and PV inverter working efficiency. Usually the PV inverter's working efficiency can be Up to 90%, PV system in the PV system to increase the tilt angle of the study, if you receive a relatively large amount of solar radiation, you can choose a larger solar energy project for solar energy operation, it can increase the fixed angle, the corner of the season to adjust and automatic tracking research, make full use of solar radiation to improve efficiency, while doing a good job in investment and operation and maintenance costs management tilt. The use of solar radiation efficiency to improve the efficiency of automatic tracking to ensure efficient control of the computer system for photovoltaic power plants to ensure the maintenance of photovoltaic power generation before and after smooth progress.

Large-scale PV power plants have a fixed inclination mode of operation, according to the PV array inclinometer to improve the latitude of the project analysis to ensure that the PV array can receive the total annual solar radiation. The traditional fixed tilt mode of operation to ensure that the monthly maximum for the solar energy Exposure acceptance. Doing a good job of computer software application, if the power station is in the Northern Tropic of Cancer, according to the Earth's revolution operation rules, to improve the PV array azimuth choice and PV array conversion efficiency, put forward to rationalizing the panel installation investment and maintenance cost management, thus effectively reduces the tracking system, to achieve a good job of adjusting the angle. The clean energy software can also be used to do the calculation and analysis of renewable energy technologies, energy efficiency, energy production, energy efficiency, life cycle costs and emission reductions.

Three-phase grid-connected inverter computer designs, solar energy can be effectively converted into DC through the PV array, and then increase the maximum power point of operation, the maximum power tracking algorithm can be used in the DC side, through the effective grid-connected inverter output to improve the transformer public power grid Set. Generally, the amount of photovoltaic power generation will be greatly influenced by the weather. In the meantime, voltage fluctuation problems will also occur due to temperature and light intensity changes, resulting in harmonic pollution. Therefore, it is necessary to optimize the operation mode of photovoltaic arrays and increase the power generation capacity of photovoltaic power plants to a certain extent Weaken the voltage fluctuation, improve the reasonable control and management of the inverter according to the system shortage, and ensure the photovoltaic power station can continuously improve the power factor and low harmonic content current output. But also make full use of computers to make PV power generation voltage space vector empty eating, using voltage space control strategy using the inverter to improve the switch signal portfolio management to ensure that the inverter output voltage space efficient operation and reduce the cost of the inverter, Reduce the switching loss during the conversion period to improve the system power factor and sine width modulation, timely conversion efficiency is relatively high and current waveform deformity changes, control current digital mode. According to the basic situation of PV power plant project, we do a good job of optimizing the tilt angle of the array, effectively adjusting the PV operation level, using various computer software to do the PV fixed inclination mode analysis, designing a reasonable double closed-loop voltage space vector control mode, establishing a good Of photovoltaic power station system model simulation processing, make full use of three-phase current wave to improve power station multiples, reduce the harmonic content, optimize the invertibility of PV array operation mode, improve the effective design of PV inverter, at the same time protect the photovoltaic power generation system in a timely manner Replacement, improve the level of power generation efficiency.

5. Analysis of Photovoltaic Power Plant Grid Operation

Solar power mainly depends on a number of factors, first of all, the ambient temperature, light intensity and angle for incidence, we need to do good solar power system maintenance, statistics and analysis of operational data, to improve statistical analysis, improve the query about the weather, if the PV power output in sunny weather, according to meteorological conditions to improve the regularity, the sunrise force curve is basically formed a good distribution, according to the sine smooth handle. In the case of cloudy and rainfall, it is necessary to regularly raise awareness of
regularities. In the summer operation period of photovoltaic power plants, the management of plant operation time is to be improved. Close analysis of the meteorological conditions of the photovoltaic power plants shows that the photovoltaic power generation is effective against 80% of working hours, generating the largest contribution to improving the impact on capacity management to protect the PV power generation to increase the magnitude of change, while ensuring the effectiveness of photovoltaic power generation in accordance with the duration [1].

In summary, the PV power plant output has a certain intermittency, randomness and periodic characteristics, we need to continuously improve the basic control of PV output, the stability of the system running equipment in order to improve the PV power plant output load, as for the photovoltaic plant operation characteristics to improve the planning design scheduling work. Make full use of computing software to improve the level of calculation and drawing, to ensure the establishment of a good line for photovoltaic power generation investment management, while using photovoltaic power generation to improve substation expansion, improve the level of investment and utilization efficiency. The dispatch and operation department made analysis on changes according to the weather to improve the rationality of the photovoltaic power generation forecasting system and ensure the smooth progress of photovoltaic power generation. Strictly according to the weather changes and simulation output technology, improve the efficiency of photovoltaic power generation and optimize the reserve capacity of the system [3].

In the PV power plant data analysis, it is necessary to improve the control of seasonal and weather changes of PV power plants, ensure the reasonable installed capacity, optimize investment in photovoltaic power generation and save investment, make full use of the prediction and management of photovoltaic power plant operating characteristics, and specifically improve the specific construction of photovoltaic power plants module analysis, effectively protect the operation of photovoltaic power plants rationality. In the process of PV power plant operation, it is necessary to give full play to the key effects of PV power generation modeling, to improve the distinction of operational characteristics of PV array units, to simplify modeling and analysis of inverters, and to make targeted interconnections based on various computer software control management, optimize PV system settings. According to the general situation analysis of large-scale photovoltaic power station engineering, it is necessary to continuously improve the optimization of the tilt angle of photovoltaic array, make full use of computer software for data analysis, improve the analysis of operational data, optimize the computer design of the PV array unit curve according to the traditional fixed inclination, do good solar energy data analysis to improve the double closed-loop voltage vector control strategy research, through the establishment of good data analysis, to improve photovoltaic power plant simulation model. At the same time, a good current waveform and power factor should be established. The optimal design of photovoltaic system should be improved on the harmonic content, and the control of computer data should be well controlled so as to continuously promote the conversion efficiency of photovoltaic power generation system, optimize the photovoltaic design mode, make full use of computer software for the photovoltaic power plant array operation curve drawing [3].

6. Conclusion:
To sum up, according to the research on photovoltaic grid-connected power generation technology, it is necessary to improve understanding of the system structure of photovoltaic power stations in order to improve the analysis of modules of photovoltaic arrays, inverters and systems of the core devices so as to effectively improve the overall level of photovoltaic power generation and optimize the photovoltaic lighting understanding of the changes in the law of strength and temperature. At the same time, we must fully integrate photovoltaic power generation to improve photovoltaic power generation inverter application structure design.

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