

The Types of Stealing Electricity and Prevention Measures

Fei Yang¹, Wang Chuang¹, Liu Bo¹, Yang Rui¹, Bai Xue², Li Yingxi¹, Cheng Shuo¹, Hu Guibin¹, Guo Deyi¹, Liu Peng¹, Tang Hui¹

¹Fushun Power Supply Company, Liaoning Electric Power Company Limited, State Grid, China

²Huludao Power Supply Company, Liaoning Electric Power Company Limited, State Grid, China

Keywords: stealing electricity, remote control stealing electricity, series resistance, signal interference, prevention measures

Abstract: This paper states the common stealing electricity types, it is remote control stealing electricity, resistance is strung into watt-hour meter, there is space of stealing electricity, obvious short current coil, interference of high power electric signal and using electricity bypass the metering device at the junction box of the back cover, and corresponding preventive measures are provided for the several stealing electricity methods.

1. Introduction

The latest high-tech stealing electricity technology, users use special high-tech intelligent power wireless technology to interfere with stealing electricity, stealing electricity is rampant in some region, there is the existing spread trend, the using the power wireless signal of stealing electricity device to interference with CPU of watt-hour meter, so watt-hour meter can't work normally, no or less electricity, also may restore electricity measurement at any time, this operation time of stealing electricity method is short, strong concealment, and high power signal is launched to interference with watt-hour meter outside the table box without moving any power equipment, so power supply departments could not find any clues in the case of knowing stealing electricity in the scene. In order to monitor users comprehensively, some power supply departments invest a lot of money to install a remote monitoring system, the above stealing electricity method makes less electricity meter itself after the application, system can't determine that its load is reduced or stealing electricity, even stealing electricity can be determined to inspect the user on-site, also because of the short stolen electrical operation time (it only takes a few seconds), the inspectors arrive, any clues to stealing electricity aren't found. There is no effective way to prevent the power supply system of this kind of high-tech and intelligent stealing electricity mode, the result is that stealing electricity system expands rapidly in some places, resulting in high line loss and great loss.

2. The Common Methods of Stealing Electricity

2.1 Remote Control Stealing Electricity

There are some part name of the isolating switch and resistance in Fig.1 and Fig.2, there is stealing electricity in the bade cover of the junction box in Fig.3.

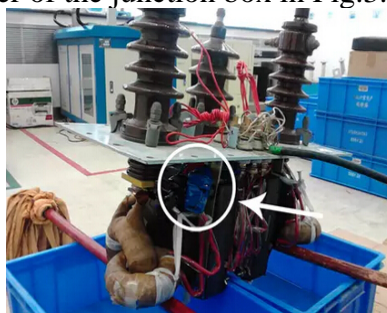


Fig.1. Part name of the in isolating switch.

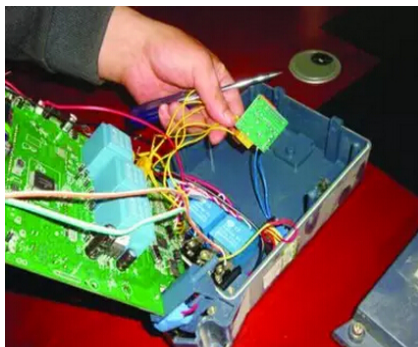


Fig.2. Resistance is strung into watt-hour meter



Fig.3. There is stealing electricity the bade cover of the junction box

The controller is implanted in the place, and that place cannot be observed by the naked eye, the method of short connection shunt, series resistance and partial pressure is adopted to achieve the purpose of low electricity quantity. The controller is controlled by remote control, and regular remote control is usually adopted to create the illusion of normal electricity.

Preventive measures-using the electric power meter box of anti-stealing electricity pouring type.

2.2 Resistance is Strung into Watt-hour Meter

It is necessary to string the resistance into the back end of the current and voltage sensor in the watt-hour meter, so that the collected current value is smaller than that of the measurement unit, so as to achieve the purpose of stealing electricity.

Preventive measures-seal management and watt-hour meter cycle inspection should be strengthened.

2.3 There is Space for Stealing Electricity in the Back Cover of the Junction Box

Placing a resistor and controller in the back cover of the junction box, stealing electricity is done by remote control.

Preventive measures-using transparent test junction box.

2.4 Connection Current is Shorted Blatantly

Short-circuited current coil and high-power signal interference are shown in figure.4 and figure.5. Using electricity around the metering device is in Fig.6.

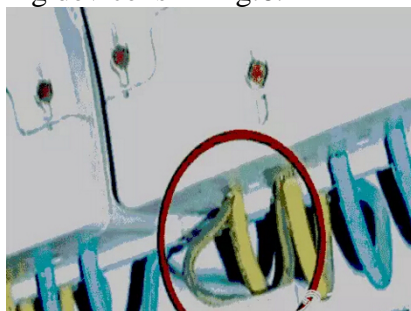


Fig.4. Short-circuited current coil



Fig.5. High-power signal interference



Fig. 6. Using electricity around the metering device

Short connection shall be made at the button of the inlet and outlet line for watt-hour meter. If there is a current transformer, short connection shall be made at the terminal row and junction box by means of wire.

Preventive measures —the power inspection is strengthened and watt-hour meter reading inspection system is established.

2.5 High Power Signal Interference

High power signals interference with the internal components of the watt-hour meter, or other signals change the internal data of the watt-hour meter, it can be minimized or ignored.

Preventive measures — by strengthening the monitoring of remote metering automation system on abnormal metering, the abnormality is found out to handle on site in time; The inspection system of watt-hour meter reading process should be established without metering automation.

3. Using Electricity Bypassing the Metering Device

Bypassing the metering device is mainly embodied in the private to the public line, the characteristic of this stealing electricity method is easy to damage field, when households know checking electricity, power wires are dragged forcibly in time, and inspectors don't obtain evidence.

3.1 The Principle of High-tech Remote Control Stealing Electricity

The current domestic popular metering box is basically divided into two kinds, one kind is oil immersed type, the other is metal shell type, there are three-phase three-wire watt-hour meter and three-phase four-wire watt-hour meter, cable connection is used in intermediate, its structure design and installation is convenient, cheap, welcome by the general power supply department. The using accounted for more than 30%, but in individual regions, driven by economic interests, some power enterprises want to obtain illegal profits, stealing electricity molecules are artificial to cause blackouts, the high voltage metering box is opened, hanging core, voltage winding resistance can be remote controlled adjustable, the wireless remote control can adjust the size measuring voltage loop, electricity meter is made less, or remote control switch is added in the voltage winding voltage, it caused the remote control measurement circuit open, resulting in failure of measuring voltage loop, the voltage coils of watt-hour meter, pressure loss, resulting in watt hour meter loss of pressure. According to their requirements, stealing electricity person is convenient for remote control at any time. Due to using the electronic remote control in device and other high and new technology, the

advantages are small volume, convenient installation, strong concealment, easy controlling, even if power supply department doubt its electricity, the survey was carried out on the error of measuring boxes (remote control device has been reset at this time, still qualified than error), checking power supply is difficult to be found extremely. Stealing electricity device is shown in Fig.7.



Fig.7. Stealing electricity device

3.2 Preventive Measures for Remote Control Stealing Electricity

With the deepening of the high for the gauge transformation, high voltage metering box is used more and more widely in applications for the electric energy metering, due to the measurement on the high side, traditional stealing electricity protection is more and more difficult, but power driven by huge profits, various means is used to carry on the power, the method of stealing electricity turn high science and technology increasingly. For example, using electronic remote control method for power in the high voltage metering box. the using is becoming rampant in some areas.

The demonstration of stealing electricity technology means the measures of stealing electricity technology. Step 1, the appearance of the stealing electricity device includes the signal transmitting end and the signal receiving end. Step 2, the high voltage meter box commonly is used by power companies from the outside, there is no difference at all. Step 3, the meter runs normally. Step 4, transmitting a signal to a meter box with a burglar device. Step 5, although the meter is still running after sending the signal, it can't accurately represent the amount of power. Step 6, recovery signal is sent by the stealing electricity device, and the meter runs normally after the recovery.

4. Conclusions

In order to ensure the activity effective, the anti-stealing electricity panel is set up, the implementation plan is formulated, the responsibility to implement is detailed, the emphases of checking stealing electricity is confirmed, the predominant combined with the long-term effective mechanism is established and improved.

1) It is important to organize all middle-level cadres, relevant special responsibilities of the Marketing Department and marketing staff of power supply stations to hold anti-stealing electricity mobilization meetings, the significance of this activity is advertised, reward and punishment measures are clarified.

2) Public security organs and relevant government departments are actively contact, an power joint agencies is formed, daily contact cooperation mechanism is made, joint investigation, the stealing electricity is struck, high pressure situation of stealing electricity is built.

3) Charging outlets "power" propaganda slogans in the power substation or the "power" in the form of relevant laws and regulations of flyer are put, users to report power is encouraged, a crackdown on power illegal and criminal activities and good atmosphere of electricity are built in accordance with the law.

4) Stealing electricity is combined with reported no verify several times in recent years, and the default behavior of users and electricity line loss are on the high side and abnormal fluctuations are

in line loss of 10kV line big users and high damage area of zero power, power the residents of the small user complete the statistics and finishing work, such as certain good checking secret area and the focus of the users, from one to the other, there will not be any soft-pedaling.

References

- [1] Xiang Tieyuan, et al. Software for harmonic measurement error of inductive ammeter [J]. China instrument, 2004.
- [2] Yu Zhongnian, et al. Power consumption of power grid. China electric power press, 2000.
- [3] Li Kaizhou, discussion on the power quality problem and the influence of harmonics in electric energy measurement [J]. China new technology and new products, 2010.
- [4] Zeng Yuan, analysis and discussion on the influence of harmonics on the accuracy of electric energy metering [J]. Science and technology wind, 2010.
- [5] Wang Siyuan, Peng Xinrui. A new harmonic measurement technology in distribution network [J]. Electrical technology, 2008.