Intelligent Monitoring Product Introduction

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1. Background



Generator collector ring is an important device to transfer the excitation current under the high-speed rotation of the rotor, and the device is prone to the following phenomena in operation:

high local temperature, uneven current-carrying carbon brushes, excessive vibration, and oil leakage from bearings, etc., and some of them will also be overloaded due to the overload damage caused by untimely replacement of carbon brushes.

The above faults may exist individually, or a variety of faults co-exist. If short-term attention is not paid in time, problems such as slip ring fire may occur, and if these faults are allowed to expand for a long period of time, it may cause major accidents such as collector ring fire and non-stopping of the unit.

1.1concrete issue



1.2practical example



合肥电厂集电环因温度高烧毁

The collector ring of Anhui Hefei Power Plant was blocked by willow flakes being sucked into the outer cover and blocked the ventilation slot holes, and the temperature of its collector ring continued to rise

but was not paid attention to in time, resulting in the burnout of the collector ring.



Negative 8 brush grips and carbon brushes burned out due to

印度莎圣电厂因未及时更换碳刷过载跳火后刷握和碳刷烧毁

overloading and tripping of carbon brushes that had not been replaced in time for the end of their useful life at the collector ring of Shah Sahib Power Plant, India.



乐清电厂碳刷和滑环接触温度达142℃

The static excitation device of 660MW hydro-hydrogen-cooled generator of Zheneng Yueqing Power Plant can reach a maximum temperature of 142 °C (ambient temperature of 41 °C) at the contact between the slip rings and carbon brushes due to uneven current-carrying.

2.Function Introduction

(1).Slip ring and brush grip surface temperature monitoring, fault judgement

alarm and other functions;

(2).Carbon brush life monitoring, fault judgement alarm and other functions;

(3) .Carbon brush current monitoring, fault judgement alarm and other

functions;

(4) .Carbon powder collection device operation data collection monitoring, operation control, alarm, fault protection and other functions;

Docking with DCS system through data communication to achieve data exchange.



①Users can check the operation data and status of static collector ring device at anytime and anywhere through the collector ring intelligent monitoring software (or APP) - unmanned or reduce the daily manual inspection workload, and put limited manpower into other more complex or more effective work, and obtain better short-term economic benefits.

② Collector ring intelligent monitoring software (or APP) can actively push

collector ring device temperature and carbon brush life alarm signals to the user, and push intelligent maintenance suggestions analysed according to the carbon brush current monitoring value - make the collector ring device operate in a better condition all the time, and reduce the cost of minor and major repairs.

③ Collector ring intelligent monitoring software (or APP) Through the continuous accumulation of platform data, the root causes of various problems of the collector ring are gradually analysed, and through the continuous upgrading of the software (or APP) - more and better operation and improvement suggestions are put forward for the operation of the collector ring, which prolongs the service life of the unit and obtains great long-term economic benefits.

2.1Collector ring temperature monitoring



Working Principle:

①Infrared thermal imager with non-contact measurement of the object under

test

②Signal acquisition and software display

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Functions realised:

①Real-time temperature display

②Slip ring surface temperature

③Carbon brush and slip ring contact surface temperature

④Collector ring area temperature

⑤ Temperature overrun alarm to avoid all kinds of risks caused by high temperature of slip rings and carbon brushes.

⁽⁶⁾ Temperature history data record, query the history data and temperature trend of slip ring and carbon brush operation.

practical example:

models	Related Configurations	Configuration differences			
300Mvar dual	Imported thermal	Requires data adapter box			
water-cooled regulator	imported thermal	Dedicated data			
Zhuhai Power Plant	imaging cameras	conversion software			
50Mvar air-cooled		Data Direct Connect			
regulator		Data Direct Connect			
	Domestic thermal	Switch			
Gaoyantun Combustion	imaging camera	Firmware can be			
Machinery & Electricity		customised			
Plant		customiseu			

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2.2Carbon brush life monitoring

Working Principle:

①Synchronised displacement of the device and the carbon brushes, generating

a signal when the warning position is reached



②Signal acquisition and software display

Functions realised:

①A single brush grip is the alarm unit, if any of the carbon brushes in the brush grip reaches the end of its service life, the alarm will be triggered, prompting the operator to replace it.

② Adjust the carbon brush wear sensor switch determination time and debugging simulation through the software to ensure that the alarm system operates normally and does not generate false alarms.

practical example:

models	Related Configurations	Configuration differences			
200Myar dual		Carbon brushes to be			
	Hall switch	customised			
water-cooled regulator		One signal per brush grip			
		Brush grips do not require			
50Mvar air-cooled		customisation			
regulator	contact switch	One signal output per			
		brush			

2.3Carbon brush current monitoring





Working Principle:

①Current sensor monitors carbon brush current

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②Signal acquisition and	software	display
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Functions realised:

①Monitoring the current of each carbon brush and displaying it in real time

②Current history data is recorded and given based on recorded values and

background logic:

③Flexibility running operation recommendations

④Recommendations for maintenance of brush grip springs

Slip ring surface maintenance recommendations

3. Hardware function extension development

①Collector ring temperature monitoring

Increased visible light probe configurations

Reduced camera costs

②Carbon brush life monitoring

One brush grip contact switch design

Eliminates need for custom carbon brushes

③Wireless transmission capability

Differences in wireless transmission implementation

WIFI mode/4G/Bluetooth/Lora

4.Software Introduction



The software development version can be customised according to the customer's requirements, is an industrial control soft configuration parts, on the Windows XP, Win7, Win8, Win10 operating systems have good compatibility, can be in 32-bit, 64-bit operating systems in stable operation, has a powerful configuration functions and data transmission functions, and has a powerful configuration function and data transmission function. It can run stably in 32-bit and 64-bit operating systems, and has powerful configuration functions and data transmission function functions and data transmission function. It can run stably in 32-bit and 64-bit operating systems, and has powerful configuration functions and data transmission function functions and data transmission function. It can run stably in 32-bit and 64-bit operating systems, and has powerful configuration functions and data transmission function functions. It has powerful configuration function and data transmission function, which can meet the application and development of various monitoring methods and control functions of the monitoring system.

Functional Support:

①Support third-party interface code, can accept application software SDK development kit for various sensors.

②Support real-time and historical data curve recording and storage functions.③Support a variety of remote communication functions, such as Modbus

TCP/IP, Modbus RTU/DTU and other standard data communication protocols, suitable for industrial Large data collection.

(a)Support Web/Internet remote configuration function, increase the corresponding software Expansion packages, mobile phones, tablet PCs and other mobile customer terminals can achieve remote Data monitoring function of mobile phones, tablet PCs, etc.

⁽⁵⁾Support all kinds of hardware bus module driver function, provide support for data acquisition hardware module. module for data acquisition.

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