

Overview of Modern Chemical Instrumentation and Chemical Automation Process Control

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Abstract: *With the rapid development of our country in the field of industrial and chemical production scale is expanding, not only in terms of production technology, modern chemical instrumentation in control, and also in the intelligent measurement and control, the direction of the diversified development, so as to ensure safe and reliable products, and promote the sustainable development in the field of chemical industry in our country. This paper mainly analyzes the process control of modern chemical instrument and chemical automation.*

Keywords: Modern Chemical Instrument; Chemical Automation; Control.

1. INTRODUCTION

Chemical industry is an important part of our country's economy and plays an important role in the process of our country's industrialization. Under the concept of energy saving and environmental protection, the chemical safety and production efficiency of chemical products must be realized by instrument control automation technology. Analysis of chemical instrument automation process control technology advantage and further improve the level of intelligent instrument related issues. Chemical automation mainly refers to the optimization management of each link in the chemical production process with the help of advanced production equipment. From a process perspective, chemical automation refers to the small number of people involved in the production process and the operation of the plant. Detection, analysis, processing, evaluation, and control operations can be automated by designing and meeting the operating requirements of tools and equipment. the application of chemical automation means provides material and technical support for improving the level of chemical production automation. Chemical enterprises in the selection of chemical products, can be combined with the actual production needs, choose high production efficiency, high safety index of automation products.

2. BASIC INFORMATION OF AUTOMATIC INSTRUMENT

2.1 From the point of view of assembly structure, thermal automation has a wide range of functions

The cooperation between the above equipment and the three technical components of the monitor is aimed at successfully realizing and giving full play to the technical control function of the monitor. the basic principle of thermal automation equipment, industrial automation and thermal engineering equipment is to introduce equipment into sensor suites and mechanical production equipment [1]. Node structures must overlap, and temperature, pressure, and flow signals must be converted to telecommunication signals. Therefore, the signal must be amplified and converted into a convenient and powerful signal form, depending on the second monitor or the device's own counter. DCS signal transmission system of the special card through the signal cable conversion, can be converted into DCS compatible with the data format for analysis and control. Finally, the display station is analyzed and operated by engineers.

2.2 Modern chemical equipment automation process control means

2.2.1 Layout of automation input in the whole process of long night chemical engineering

The performance of chemical instrument is stable and effective, but in order to maximize the level of automation of chemical instrument, it is not enough to only improve and update the technology of chemical instrument. Improve the whole process of chemical production capital and technology input, strengthen the whole chemical production process automation level, increase the company overall management automation in the field of production management level, according to the principle of intelligent manufacturing, combined with the thinking of

improving chemical industry automation, management innovation, are the internal and external automation conditions of chemical production, give full play to the role of the chemical instrumentation automation.

2.2.2 Application of computer functions

Computer function is the close connection between computer technology and modern chemical means. Make use of the powerful computing power of the computer to improve the accuracy of data and calculation speed. In traditional chemical equipment, the way of digital display circuit is relatively single, which requires staff to carry out numerical calculation and estimation. the reference of computer functions can successfully solve various problems through real-time reporting and feedback of various values and solving the inherent hidden dangers in production [2]. the application of computer function greatly improves the testing accuracy and has a positive effect on the further optimization of production management.

2.2.3 automatic control

After the debugging of thermal instrumentation automation equipment, the system must be tested to ensure its normal operation. Detailed analysis is required during system operation. If the system has potential risks and faults, modify and debug the system immediately to ensure system stability and reduce the probability of faults during automatic system debugging. Investigate and analyze independent data on large-scale devices to verify the accuracy of the data. For example, during commissioning of large units, operators can not only identify operation data, but also study and analyze the functional characteristics of each latching device and check the operation of the automatic scheduling system after three working days of system testing and commissioning.

2.2.4 Contact and remedial measures

From a practical point of view, many environmental factors can affect the installation process of equipment. In many industries, sealing, compression, vibration and corrosion defects can be considered negative environmental factors. In addition, other thermal systems also need active coordination. Therefore, in many cases, it is inevitable that the installation of these systems will be affected by the environment. This requires proper configuration and management of thermal power stations. During installation and construction, workers must strictly comply with the relevant requirements of the state at this stage. Use commercial standards and environmental realities to minimize the impact of environmental factors on equipment design. When ordering equipment, the company will try to avoid the phenomenon that the connection size does not match the actual situation. At the same time, do not leave tightness. And ensure that the size of the actual cable situation. Therefore, considering the environmental factors in actual operation, the influence of thermal equipment is reduced. Make sure the connection is closed when installing the tool [3]. To reduce joint tightness during installation, do not overlook the importance of screws. If the seal cannot be safely sealed due to special conditions, silicone and other materials must be used to optimize the seal performance. For example, abnormal flow during conveyor belt separation in the furnace may be due to joints, which may cause damage to poorly sealed equipment and thus further damage to the power part of the equipment. Also, if a typical power failure occurs, consider that some components may not work properly. In this case, the indicator light is on the back of the circuit. When the lamp is turned on, there is no fault in other circuits, and the fault location is found according to the above method.

3. FOLLOW UP THE MAINTENANCE AND MAINTENANCE OF CHEMICAL INSTRUMENT AUTOMATION APPLICATION

In the use of instrument automation in chemical industry, design and implement strict instrument equipment maintenance system, to ensure that chemical instrument always maintain high parameter accuracy, to ensure the efficiency and safety of chemical production process. Assign professional maintenance personnel to participate in the maintenance process to avoid electronic short circuit of control and instrument. In view of the complexity of working conditions of chemical instruments, the accuracy of data parameters under extreme production conditions is verified by experiments. If the data are inaccurate, adjustments must be made immediately to avoid compromising the quality of the chemicals produced.

Hierarchical management and prevention mechanism Instrument automation plays an important role in the development of chemical enterprises. According to relevant data, implement scientific and reasonable instrument automation equipment management plan, strengthen staff operation preparation. the operator checks the automation system periodically to ensure the effective implementation of routine maintenance. Professionals should carefully check the equipment to ensure that the working modules of important equipment are in good

condition. the inspection is divided into two parts: external routine inspection and internal key workplace inspection.

4. CONCLUSION

Chemical production plays an important role in our country's economic development. In the process of chemical production, automatic function instrument can improve the quality of chemical production significantly. Chemical instrument automation is the inevitable trend of chemical development. Automatic control technology plays an important role in the automation of chemical instrument control process. According to the type and application of chemical instrument, to create an environment for instrument automation control, management and application of technical documents, timely maintenance and maintenance, effectively improve production efficiency and management level.

REFERENCES

- [1] FANG PENGdi. Discussion on process control of modern chemical instrument and chemical automation [J]. the wind science and technology, 2019(9):77.
- [2] GENG Yongfeng. Process control analysis of modern chemical instrument and chemical automation [J]. Chemical Industry Management, 2019(26):145-146.
- [3] MIAO Y L. Study on process control of modern chemical instrument and chemical automation [J]. Chemical Industry Management, 2017(36):163.