The Study on Controlled Process of Sludge Disposal Incineration

Fei-Fei XING\textsuperscript{a}, Jun JI\textsuperscript{b}

Beijing Polytechnic, Beijing 100176, China
\textsuperscript{a}xingfeifei@126.com, \textsuperscript{b}ji_jun2000@sina.com

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Abstract. The sludge incineration technology has become a mainstream of sludge disposal, and it is becoming more and more popular all over the world. According to the domestic research, the paper presents the sludge incinerator control components and control process, and points out the core technology.

Introduction

The sludge incineration technology has become a mainstream of sludge disposal, and it is becoming more and more popular all over the world [1].

Sludge incineration is a big part total sludge, for example, Denmark 24\%, France 20\%, Belgium 15\%, Germany 14\%, the United States 25\% and Japan 55\%. Sludge incineration has the advantage over other methods: large volumes of sludge was burned into ashes of small volume stability, which only is 10\% of the sludge mechanical dehydration; through high-temperature Sludge incineration can destruct the toxic organic molecular structure; the value of dry sludge is Equivalent of coal calorific, therefore, energy can be recycled by burning, which makes sludge incineration very attractive. Although incineration generates a certain amount of exhaust emissions, the matching tail gas treatment and incineration technology have greatly improved, and current technology effectively controls the gas emissions; incineration costs has increasingly competition comparing with other methods. To a certain extent, incineration is the only solution when other ways faced with the various difficulties [2].

Domestic sludge disposal problem is increasingly urgent, the mainstream technology of drying and incineration technology have maturely applied in foreign countries, which will also be a trend of the sludge treatment and disposal in China. The sludge market in China will grow steadily and the resulting sludge corresponding to the equipment market will grow.

However, the control strategy and model to the incineration of sewage sludge incineration furnace have no mature experience to learning. Through the implementation of a project will facilitate the incineration system design of standardized device control, save development costs, ensure the quality of burning control system, improve the incineration technology of enterprise strength, enhance the core competitiveness of enterprises, can further enhance sludge treatment and disposal system’s market share. It is also consistent with national incineration technology of developing environmental protection policies, and it better participates in national key high-tech Valley-resource and environmental technologies.

The Components of Sludge Incineration

The control model of construction sludge incineration is divided into dry sludge feed control, wet sludge feed control, temperature control, furnace pressure control, water control, start the burner control, and auxiliary burner control. The control system makes every parts work together.
The Control Process Flow Diagram of Furnace

Burning furnace control process is following: when the start conditions meet requirement, operation personnel issues start command, and program will set furnace pressure for preset pressure; the first wind machine run, after 1 minutes, control loop started and controlled once air; pump started, furnace within temperature is less than critical temperature, odor will come into ion except smelly system; when temperature is greater than critical temperature, odor will come into burning furnace burning. When the start the burner meets the conditions, burner starts and controls the amount of oil and temperature. After temperature is higher than critical temperature in the furnace, oil gun will
launch conditions to meet the case; operator initiates oil gun. By setting a predetermined temperature values, temperature can be kept close to the set value range of temperature in furnace, and maintain temperature stability.

When meeting the muddy conditions, operator will start instructions and incinerator feed screw. Loop controls wet sludge flow. Balance control system can maintain two types sludge are approximately equal. In the dry mud under the meet the conditions, metering tank will automatic input the dry mud, dry mud and wet mud will mix into the incinerator burning, which is to ensure the calorific value of sludge, and prevent the temperature surging too fast and exploding.

**Key Technical Points**

The paper involves in the reconstruction of traditional industry-high performance, intelligent instrumentation-new automation technologies-new field control system technology.

Core technologies are as follows:

1) According to the process conditions, we choose appropriate temperature, pressure, flow, material and process measurement instrumentation, real-time parameters of incinerator, for control systems to provide reliable sources.

2) Control system uses the redundant frame integrated controller, c/s network architecture, and sets up ether-net ring collection, interactive network to ensure reliability and stability control systems.

3) Study of incinerator temperature control is the core. On the condition of safety, reliability and economy, the temperature control is divided into 3 loops, feed control, control of auxiliary fuel, the control of cooling water.

**Conclusions**

This paper studies the incinerator present situation and significance, presents the sludge incinerator control components and control process, and points out the core technology.

**References**
