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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

DL/T 435-2004

**Code for the prevention of pulverized coal firing furnace
explosions/implosions in power plant boilers
(English Translation)**

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Foreword

According to the Document Zong Ke Jiao [1998] No.18 issued by the previous Ministry of Power Industry "Notice on issuing the Development and Revision Plan of Professional Power Standards", this Code is revised based on DL 435-1991 "Code for Prevention of Pulverized Coal Firing Boiler Firebox Explosion/implosions in Thermal Power Plant".

There have been some significant changes in this Code over its previous editions in the following technical aspects.

- MODIFY specified value of the furnace structural design pressure;
- ADD terms;
- ADD content on preventing furnace implosions;
- MAKE new supplement on the provisions of relevant equipment and their system requirements as well as the running operations;
- ADD Informative Appendix "Reasons that may cause furnace explosion" (Appendix A);
- ADD Informative Appendix "Explanation on the transient state pressure-bearing capability designed for the furnace" (Appendix B);
- ADD normative appendix "Fuel trip time delay and additional alarm items" (Appendix C).

This Code replaces DL 435-1991 since its implementation.

Appendix A and Appendix B of this Code are informative.

Appendix C of this Code is normative.

This Code was proposed by China Electricity Council.

This Code shall be under the jurisdiction and under the explanation of Technical Committee for Standardization on Professional Power Plant Boilers.

This Code was drafted by Thermal Power Research Institute.

This Code was mainly prepared by Zheng Zemin, Gao Hanxiang, Yuan Ying and Xu Chuankai.

This Code was first-time issued on September 18, 1991.

Code for the Prevention of Pulverized Coal Firing

Furnace Explosion/Implosions in Power Plant Boilers

1 Scope

This Code specifies basic requirements on relevant equipment and system aspects for prevention of pulverized coal firing furnace explosions/implosions in power plant boilers, shows out guide for the on/off sequence and operation of equipment.

This Code is applicable to pulverized coal firing furnace in power plant boiler.

2 Terms

For the purposes of this Standard, the following terms apply.

2.1

main primary air shut off gate

It is a kind of main air gate which can be closed tightly and prevent the primary air entering the burners; generally, it shall be mounted on the pulverized coal-free airflow, such as primary air fan outlet of positive pressure direct-blow pulverized-coal system or coal pulverizer inlet of negative pressure direct-blow pulverized-coal system and storage pulverized-coal system.

2.2

flame detector

The equipment to detect the flame-free and provide signal.

2.3

directional blocking

A sort of interlock system moves to the likely-to-be enlarged deviation direction and all the relevant final control elements must be prohibited when the furnace pressure is tested to deviate from the normal value significantly.

2.4

fan test block capability

2.11

ignitor

It can provide adequate ignition energy for igniting the permanent devices (including sparker, igniting oil and popgun) of the main burner fuel for an instant. The capacity of the ignitor as close relationship with the fire behavior of the main fuel, burner type and requirement for the ignitor function, generally, it consists of Class-I and Class-II ignitors.

Class-I ignitor. used to ignite the gas-pulverizer mixture entering the furnace from the main burner in any operating condition. This type of ignitor requires large capacity; generally, it shall be over 20% of the heat quantity of the main burner under full-load.

Class-II ignitor. can only be used to ignite the gas-pulverizer mixture entering the furnace from the main burner according to the air volume and pulverized coal volume when igniting, its capacity is generally 10%~20% of the heat quantity of the main burner under full-load.

The above two ignitors are both be used for combustion-supporting under low-load or when the burning is instable, however, it may not be used as means for saving extinguishment when the furnace has been fire-extinguishing but not yet been purged according to the requirements.

2.12

warm-up oil gun

It is the oil gun for warming up boiler, lifting pressure, washing pipe and with low-load, while its thermal power hereof is larger than that of the ignitor (usually, its total thermal power is about 30% of the thermal power for the full-loaded boiler).

2.13

furnace safety supervisory system ("FSSS" for short)

It is a kind of security protection and sequential control equipment that ensures that the equipment of the boiler combustion system is safety on/off according to the specified working order and conditions, and that can rapidly cut off all the fuel (including igniting fuel) entering the furnace in critical operating conditions, so as to prevent destructive emergencies like deflagration and explosions.

Note: The primary functions of the international so-called "burner management system", "fuel-firing safety

system" or "burner control system" are identical to FSSS defined by this Code.

2.14

logic portion

stable flame

In the range of operation, and in the process of changing the load with the specified maximal variable rate, the boiler may maintain its stable-burning flame continuously.

2.21

burner

The equipment supplies the fuel and air into the furnace according to the required velocity, turbulence and concentration, and makes the fuel be on fire and burnt stably in the furnace.

2.22

burner shutoff damper

The shutoff damper loaded in front of the burners, used to shutoff the fuel-air mixture entering the main burner.

2.23

combustion control system