Case No.40

Explosion at surface treatment furnace for automobile components

[Circumstances of Incident]

This accident occurred at a continuous-type furnace used to carbonize the surface of steel plates in the automobile manufacturing factory.

In this process, steel plates are heated up to around 900°C in a continuous-type gas furnace and the steel plate surface is carbonized. The carbonized steel plate is then hardened through a heat treatment process.

The operation of the furnace where the accident occurred was totally stopped on December 30 for the year-end and new-year holidays. As it was necessary to increase the temperature inside the furnace to the prescribed temperature on the previous day in preparation for the start of operations on January 8 in the new year, some workers came to work. Victims A and B ignited burners by using an ignition torch one by one from around 8:45 in the morning. When they were about to ignite burners Nos. 26 and 27, they stopped the ignition because of the smell of gas. When they resumed the ignition after ventilating the area, there was a loud bang with flames and hot air emitted from the door at the exit side of the furnace.

Because of this, victims A and B suffered second to third degree burns on their arms, legs, faces, etc.

[Causes]

The following can be considered as the causes of this accident.

1. Combustible gas was contained in the nitrogen gas that was injected in the system for replacement before suspending continuous-type furnace operations for year-end and new-year holidays.

2. Although the standard work manual required opening the furnace doors before ignition to exhaust the remaining gas, this was not implemented.

3. Although the standard work manual dealt with furnace ignition, a decrease in
furnace temperature, gas replacement, etc., these specifications were not fully implemented by the workers concerned.

**[Caused by]** Combustible gas

**[Type of accident]** Explosion

**[Number of victims]** Two injured (requiring an absence from work)