



Source Photo: AP / South China Morning Post

## **Key Highlights & Lessons Learnt: Warehouse Blast in Tianjin, China (12 August 2015)**

This warehouse sits on a giant logistic hub which is more than twice the size of Hong Kong. It hosts auto parts manufacturers; aircraft assembly lines, oil refineries and host of other services and production lines and has a population of about 9 million. This warehouse is designed to house dangerous and toxic chemicals and was built within 100 meters from the residential buildings whilst the legal safety distance requirement is 1000 meters.

At the time of the incident, the warehouse in this complex stored mainly ammonium nitrate, potassium nitrate, sodium cyanide and calcium carbide.

Officials said that thousands of tons of hazardous chemicals were stored at the site including about 700 tons of highly poisonous sodium cyanide at two separate locations.

### **Sequence of Events**

Initially, a fire was reported at the warehouse at about 11.00 am and firemen were sent to investigate and survey the scene while their other reinforcement (fire engine etc) arrived later. On arrival, the fire crew hosed water at the blaze for about 10 minutes before the first blast occurred. No one warned them the risk that there could be dangerous and explosive chemicals which would violently react with water.

A spokesman of the fire department said that they knew that there was calcium carbide inside but did not know the exact location of the chemicals.

### **Likely Cause of the Blasts**

When the first responder fire crew sprayed water at the blaze for about 10 minutes before the first blast occurred, it could be due to the calcium carbide reacting with the water to produce a very flammable and highly explosive gas called acetylene.

The second blast about a few minutes later could be due to the acetylene igniting the ammonium nitrate which produced a massive blast equivalent to 21 tons of TNT. It was detected by the Japanese weather satellite and images showed walls of flame enveloping buildings and rows and rows of gutted cars at the import facility.

### **Casualties and Damage**

The final death toll was 173 personnel of which 97 were firefighters; 11 policemen and 8 civilians. About 474 were injured and receiving treatment of which 7 are in critical condition. The initial estimated cost to clear up the damage was about US7 billion.

### **Lessons Learnt**

This incident is a clear reminder to the chemical industry of the blatant abuse of power and dereliction of duty by the owners and the relevant government agencies. The explosions and their aftermath raised questions on industrial safety standards; as well as the enforcement of residential zoning regulations; government transparency and the adequacy of fire fighters training.

In Malaysia, we have adequate laws and regulations covering chemical warehouse safety but more importantly the chemical industry must voluntarily implement appropriate codes and best practices at their chemical warehouses. CICM has the Distribution Code covering logistics and chemical warehouse operations and our members can request for CICM's assistance.

Prepared by:  
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