

Refuse Incineration Process

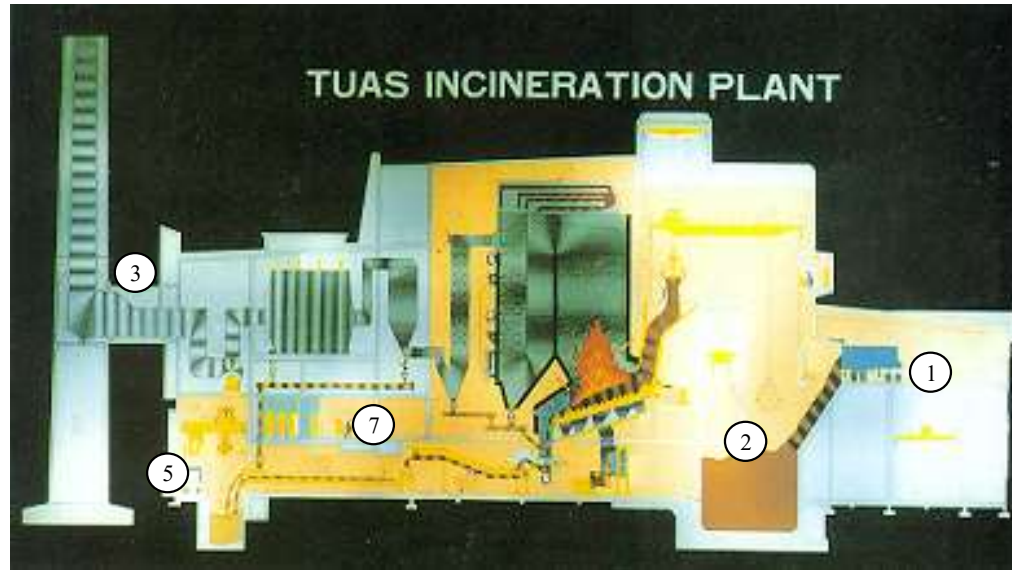


1. Refuse collection vehicles are first weighed at the weighbridges before they are permitted to drive up to the reception hall. Refuse is then discharged into the bunker through one of the 23 discharge doors. Subsequently, the empty trucks are weighed again before leaving the plant to determine the amount of refuse disposed of.

2. Refuse from the bunker is fed to the incinerators using 3 refuse cranes. Odours are prevented from escaping by keeping the bunker at sub-atmospheric pressure.



7. The Central Control Room acts as the nerve centre of the Plant; where processes are controlled and monitored through the Process Control System (PCS).



3. Air distribution and refuse feed rate is controlled by the process control system to ensure proper combustion of refuse in the furnace. The flue gas from incineration process passes through the treatment plant to remove pollutants such as HCl and dioxin and the clean gas exits through the 150m tall chimney



4. Ferrous metal is extracted from the incineration ash by electro-magnetic separators and sold as scrap to a local steel mill.



6. The heat from the combustion process is used to generate steam; which in turn drives a pair of turbines. The Plant consumes 35% of the electricity produced by the generators, selling the excess 65%.



5. Ash and slag are conveyed to the ash pit for storage. They are transported by ash trucks to Tuas Marine Transfer Station; unloaded onto barges and disposed of at Semakau Landfill.



Introduction

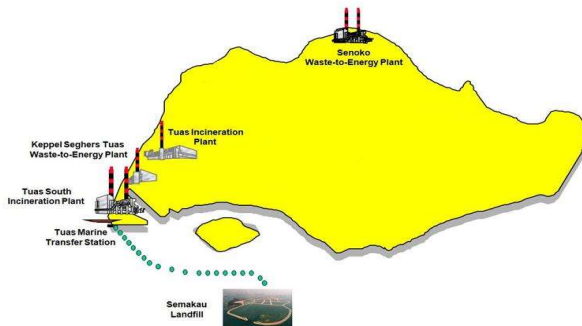
Completed in 1986, Tuas Incineration Plant (TIP) was the second refuse incineration plant to be built in Singapore. The Plant was constructed at an approximated cost of S\$200 million and sits on 6.3 ha of reclaimed land.

TIP has the capacity to incinerate 1,400 tonnes of refuse with its 5 units of incinerators. Heat generated from incineration process is used to generate electricity while ferrous scrap metal recovered from the ash is sold to a local steel mill. Various processes, including combustion conditions in the furnace, are controlled automatically by the Process Control System (PCS). The use of modern equipment and highly automated processes ensures that the Plant maintains a high standard of operation.

Incineration remains the most effective method for the disposal of incinerable waste in land-scarce Singapore as it achieves a 90% reduction in volume. There are 4 waste-to-energy incineration plants, and an off shore landfill to handle our disposal needs.

To achieve a clean living environment for all Singaporeans, National Environment Agency will continue to promote waste minimisation in the community and industries by reducing waste generation and increasing waste recycling, dispose of all incinerable waste at the waste-to-energy incineration plants, and maximise the recycling of non-incinerable waste to reduce the amount sent for landfilling.

Location of Disposal Facilities



Plant Design Data

Incineration capacity	: 1,400 tonnes per day
Number of incinerators	: 5 units
Flue gas treatment compartments	: 12 units
Steam generation per boiler	: 42 tonnes per hour
Live steam pressure	: 35 bar
Live steam temperature	: 375 °C
Power generation	: 30 MW

Plant Emission Data

(units in mg/Nm³ except otherwise indicated)

Parameter	Limit*	Plant Level
Particulate substances	50	14.2
Hydrogen chloride	200	89.7
Sulphur dioxide	1700	52.7
Carbon monoxide	250	62.8
Dioxin and furans	1	0.17
Mercury and its compounds	0.05	0.005

*Environmental Protection & Management (Air Impurities) Regulations



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Tuas Incineration Plant

Information Brochure

