

13. For the destruction of the mustard in Datujajar the incineration method was finally chosen. For the design of the incineration process the necessary basic data were taken from the above-mentioned United States reports.

14. The effluent gases from the incineration of mustard will contain fairly large amounts of the corrosive and toxic gases sulphur dioxide and hydrochloric acid. In the United States CAIDS the effluent gases are cooled and scrubbed with alkaline solution and the resulting brine spray is dried so that the residue is a mixture of harmless inorganic salts. Assuming an incineration rate of 100 litres per hour scrubbing of the effluent gases would have required for the mustard in Batujajar 15 - 30 m³ of water per hour, at least 150 tons of sodium hydroxide and would have created a disposal problem of about 10,000 m³ of brine. It would have meant a technically much more complicated installation and would have required sophisticated process control equipment with additional chances of malfunctioning. If no acceptable solution for the disposal of the brine could be found, a spray drying installation would have to be installed with corresponding costs and difficulties with the provision of the required enormous amounts of energy. Instead, to cope with the problem of toxic gases in the effluent the concept of controlled incineration was developed for the Batujajar situation.

III. CONCEPT OF THE OPERATION

15. The concept of controlled incineration, which was to be applied in the destruction of mustard at Batujajar, was based on the dispersion of the effluent gases in the atmosphere without any purification. However, the burning rate of the mustard had to be adjusted to meteorological conditions in such a way that:

(a) outside the artillery shooting range, which is roughly rectangular with dimensions of 4.5 x 1.5 km and where the incineration would take place, the Maximum Immission Concentrations (M.I.C.) for sulphur dioxide and hydrochloric acid would never be exceeded. The M.I.C. values are generally accepted maximum allowable concentrations at ground level which will not produce effects during indefinite exposure;

(b) inside the artillery shooting range the Maximum Allowable Concentrations (MAC values) for sulphur dioxide and hydrochloric acid would never be exceeded. The MAC (or TLV) values are considered to be the maximum allowable values for the time-weighted average concentrations during a normal working day, which will not produce adverse effects when the exposure period is defined as a normal working week during indefinite time.

16. The first condition would safeguard the health of the population living adjacent to the artillery shooting range, whereas the second condition would safeguard the health of the people involved in the destruction of the mustard.

17. In using dispersion models, the burning rates that would ensure the fulfilment of the above-mentioned conditions (allowable burning rates) had been calculated in dependence of the stability of the atmosphere, wind speeds and wind direction. The wind direction in relation to the shape of the terrain determined the distance over which sufficient dilution of the cloud should take place. The effluent gases would leave the chimney of the incinerator at a given speed and at an elevated temperature and the plume rise caused by these effects would have a positive influence