

In addition, to confirm the nature and quantity of agent it would be necessary to monitor any chemical substance that is added to the agent or to its decomposition products. For example, chemicals used in hydrolyzing an agent or in treating the effluent should be monitored to confirm that their use was consistent with the description of the destruction process.

Air sampling, a less intrusive technique, might supplement, but not replace, sampling of the agent stream. Current air sampling techniques can collect and concentrate chemicals which are present in the air at extremely low levels. At a destruction site, traces of the agent and its decomposition products, as well as traces of other chemicals involved in the destruction process could be collected and analysed, although sophisticated instrumentation may be required.

This procedure would yield information on the types and relative concentrations of the chemicals present in the air in different locations at the facility. It would provide additional assurance to the observers that the type of material being destroyed had been correctly represented, but would not be adequate to confirm the information on quantity. It should be noted that air sampling would have to be conducted before disposal operations were to begin so that the "chemical background" would be known. This preliminary sampling would be conducted at the locations inside and outside the destruction facility where sampling would be carried out during the destruction operations.

It would also be very desirable to check whether or not the nature of the waste handling equipment and the toxicity of the decomposition products, as well as their general composition, were consistent with that expected from the nature of the material ostensibly being destroyed. For example, most nerve agents contain one phosphorus atom per molecule. Also commonly present are either one atom of fluorine or one atom each of sulphur and nitrogen. In addition, if a tracer had been added to the agent feed, analysis of the concentration of the tracer in the effluent would help provide assurance that no diversion of agent had occurred.

Another technique which could be useful if the identity of the agent were known is the material balance. This would involve comparing the amount of decomposition products actually produced with the quantity which should result from a given quantity of agent. For this method to work, there could not be any significant loss of gases, liquids or solids from the system. It should be possible to meet this condition for chemical detoxification processes. For incineration methods, some gases may be lost, permitting only a crude balance to be obtained even when measured as accurately as possible.