

onto particulates, which are then breathed deeply into the respiratory tract. There the sulfur compounds can have a significant effect.

Our studies of specific episodes showed that in each case sulfur dioxide and particulates went up together, and remained up together for an extended period of time. The crucial point in devising the API plan, therefore, was to select some level of sulfur dioxide and some level of particulates which, together, would be safe. The development of a course of action to prevent those levels from being exceeded might then be attempted.

The first part of the effort was a close analysis of the past air pollution incidents in order to determine at what levels problems started. Our medical people determined that no health effects had ever been demonstrated when the two pollutants were together at or below the values that we since have built into our suggested control system. These values are 0.3 ppm of sulfur oxides and 4 "coefficient of haze" (Coh) units for particulates. If a way were found to determine in advance when these levels would be exceeded for an extended period, then it might be possible to tailor a community plan to reduce emissions of these pollutants at such times.

Industry technical people joined together to try to devise such a predictive system. They recommended that a network of air monitoring stations be established by any community where a pollution incident might develop. Their recommendation called for the establishment of these units on a grid network of no more than five miles separation between units.

While sulfur dioxide is the predominant sulfur compound in ambient air, they recognized that there are other higher oxides of sulfur also present. These higher oxides, the doctors state, can have adverse effects on health as well, because they too, are adsorbed on particular matter and inhaled. So our technical people considered it preferable that the test method used in the monitoring proposal detect total sulfation. The American Society for Testing and Materials Designation: D-1355-60, Method A, was recommended as the appropriate procedure. It is a method that provides continuous measurement, through conductivity, of small concentrations of sulfur oxides. The standard method for determining soiling effects of smoke pollution—ASTM Designation: D-1704-61—was recommended as the procedure for determining ambient air particulate levels. In using this method, an air sample is pulled through a filter paper. The opacity of the deposit provides the measurement of the particulate matter.

Under the API control plan, whenever the average readings of the grid network show increasing levels of the two monitored pollutants, weather reports would be studied carefully. If the forecast indicates a period of stagnant air that might last 8 or more hours—either brought about by inversion or some other cause—then an alert would be called before the pollutant values built into the system are reached. The object would be to keep the levels of sulfur oxides and particulates below these values—0.3 ppm, SO<sub>x</sub>, and 4 Coh.

Exactly what steps would be needed to accomplish this objective would have to be left for determination by the community itself according to the local situation. The community would need to study its various sources of emissions and design a series of steps to be required should an alert be sounded. Among possible steps for consideration are a reduction of incineration and the halting of open burning (if this hasn't already been completely prohibited by law). Other steps might include switching to lower sulfur content fuels temporarily in plants where burning of such alternate fuels could be made possible; and, perhaps, the modification of certain industrial operations for a time in order to produce a net reduction in pollutant emissions.

The maximum levels for SO<sub>x</sub> and particulates, in combination, that have been built into our system are stringent. The record of past pollution incidents does not show these levels to present health hazards. Yet action would be called for to cut emissions before such levels are reached. Thus a considerable safety factor has been built into the plan.

Even though the levels in the system are stringent, it is a fact that few cities ever reach these concentrations for extended periods. In a community where the combination of factors might be possible, it will usually occur at most no more than two or three times a year.

This is a positive system to predict and prevent pollution incidents. It can be established to supplement a program of reasonable year-round ambient air objectives. But objectives alone, calling for maximum levels of particular pollutants such-and-such percent of the time, cannot assure the avoidance of episodes. Whether year-round objectives are met can only be determined