

to the control of diesel emissions must be resolved before controls can be established. To this end, we are pursuing studies in the area of diesel control technology and on the establishment of appropriate control standards.

Since no let-up is in sight in the worldwide increase in the number and use of motor vehicles, we must investigate all possible approaches to controlling the problem of vehicular emissions. These may include possible replacement of the internal combustion engine with alternative power sources, such as fuel cells or electric batteries; and alternative means and patterns of transportation in and between our biggest cities, such as rapid transit lines.

POLLUTANTS FROM STATIONARY SOURCES

I have indicated, Mr. Chairman, that the ubiquitous motor vehicle is an important source of air pollution in the United States today. Of no less importance, of course, are those stationary sources of pollution which multiply in our cities and towns to meet the ever increasing demands for goods and services. In treating these stationary sources of pollution, I would like to review in general the technology for controlling some of the more important classes of pollutants, and to review in more detail the status of control techniques in some of our larger industries.

Emissions from stationary sources can be conveniently separated into two categories—particulate and gaseous emissions.

Problems of particulate emissions readily lend themselves to control by the application of already proven techniques. Consequently, industry sponsored work has been primarily devoted to improving the efficiency of proprietary control equipment. Basic research and development is needed to improve both the efficiency and the capabilities of existing devices through better understanding of the principles involved.

In the area of electrostatic precipitation, manufacturers are devoting their research and development almost exclusively to hardware development. The principal exception to this is work which is being pursued to learn more about precipitation mechanisms at high temperatures and under high pressure. Studies of fabric filtration at the higher temperature ranges are also being conducted. An area which has received some industry-sponsored basic research attention, and an area in which research and development is badly needed, is that of small particle agglomeration. For the most part, the industry efforts are aimed at the development of proprietary devices which employ sonic or thermal treatment, or condensation, to agglomerate submicroscopic particulate which can then be removed by conventional collection equipment.

Much of the work which has been done to date in the area of particulate control device development has been confounded by the lack of uniform criteria for data evaluation and equipment performance.

Because of the variety of problems and the unique characteristics of individual pollutants, the area of gaseous industrial emissions has presented a much more difficult control problem than that of particulates. Control of gaseous pollutants is typically effected through process improvement or through recovery of gaseous emissions by chemical reaction. While control of most gaseous air pollutants is possible, the economics of accomplishing the desired degree of control has generally been considered a problem. Recognition of this problem, plus the potentially more serious nature of gaseous pollution, has stimulated more research and development activity in this area than in the area of particulate control.

In general, considerable work is needed on gaseous pollution control systems to close the economic gap between possible and practical control techniques. Both basic research on systems and studies of operating variables are needed to reduce investment and operating costs before they can be practically applied. Of the presently available control equipment, the versatility of wet scrubbers to cope with both particulate and gaseous emissions places high priority on the need to develop chemical reaction processes for gaseous pollution control. This method has its greatest potential in low volume emissions.

Proper control of industrial process variables has been demonstrated as an important means for control of air pollution at the source of emissions. This includes such processes as control of excess air and flame temperatures in combustion processes, and reactant ratios and concentrations in chemical reactions. Additional research by both governmental and industrial agencies is needed to exploit this approach for an air pollution control technique.