

Sixteen sulphur dioxide recorders have been sited around a modern 1,000 MW power station situated in a rural area. The recorder layout was in the form of a ring, the radius of which was the distance of calculated maximum ground-level pollution. The results from their operation during the period October, 1963, to September, 1964, are reported. On a long-term basis the overall average effect of the power station on the concentration of sulphur dioxide as measured at these sites was small (0.1 to 0.2 p.p.h.m.) compared with that already to be found in the area (3 to 5 p.p.h.m.). Most of the pollution appeared to come from distant cities and industrial areas. The most persistent effect from the power station, amounting on average to only 0.6 p.p.h.m., was to the north-east of the station and is thought to be due to the combined effects of wind frequency and strength in that direction. Short-term (3 min) power station contributions were often detectable, but under the dispersing effect of the wind, were not usually persistent at any one site. There was no significant pollution from the power station in stable atmospheric conditions, with or without fogs.

This is an example of the careful work that should be done with increasing frequency when new plants are planned and put into service. Again I would point to the record that there was no significant pollution from the plant during stable (i.e. inversion) atmospheric conditions, conditions which would however, create a great deal of difficulty for low-level emissions.

High stacks are an excellent tool when they can be designed into the plant, or even if a substantial fraction of the life of an existing plant is still ahead of it. But what can be done for plants fast approaching the end of their useful lives? Here research is badly needed and some at least is underway. This has taken the form of investigating limestone or other alkaline additives to react with the SO_2 and SO_3 present in the stack. The following groups have been active:

(a) Paper study of reactive rate of limestone and sulfur dioxide being done at Battelle for U.S. Public Health Service.

(b) Study of limestone characteristics by Bituminous Coal Research.

(c) In American Electric Power Service Corp., a modest research program jointly with Arthur D. Little, Inc., has just been initiated. This will cover a small section of the problem that appears particularly susceptible to direct attack at this time.

It is not expected that additives would be used full time, but as a means of operating through adverse meteorological conditions.

Possibly the most significant research program of all, since it seeks to correct our basic ignorance on the long-term, low-level effects of SO_2 , is that announced since January 1966 by the Electric Research Council. In this work to be done by the Hazleton Laboratories, Inc., under contract with the council, 18-month exposures of guinea pigs and primates to SO_2 levels comparable to those found in cities and industrial areas will be conducted. Heretofore, most experimentation has been at concentrations seldom, if ever, reached even in acute air pollution disasters such as London in 1952. In order to explore the possible synergistic effects of fly ash and SO_3 mist, a number of parallel exposures will be made using these materials in conjunction with SO_2 .

This statement has been somewhat longer than I first contemplated. However, the subject is one of critical importance to the power industry and is indeed an area in which it is altogether too easy to lose sight of the industry's long history of constructive activity to abate air pollution. For example, the reduction in plant heat rate from an average 22,600 British thermal units per net kilowatt-hour in 1927