# PART II - DUST PRODUCING OPERATIONS STUDIED

WHAT ARE THE PRINCIPAL DUST PRODUCING OPERATIONS? - In order to determine to what extent if any, workers in the production of petroleum products and associated activities are exposed to the hazard of breathing dust, a survey of all dust producing operations was made at the various plants concerned. These operations, listed in order of their apparent degree of dustiness, are:

## I - SAND - BLASTING

Due to the large amount of finely divided silica dust produced by the impact of the grains of sand on the surface of the object being cleaned, sand-blasting is the most dangerous silicosis hazard encountered in our survey. Sand-blasting is used rather extensively at oil refineries for cleaning inside soaking drums, bubble towers, tar separators, run-down pans and storage tanks for metal inspection and to permit the application of gunite lining as a means of preventing corrosion. Header boxes or other similar parts, tubes in cracking coil fire boxes and return bends are sand-blasted to permit a detailed and thorough examination for cracks and defects. Sand-blasting is also employed in the removal of corrosion from under floating roof tanks; for removing roughness or rust from steel shapes or rods; for cleaning bell caps, bubble plates, trays, and pipe prior to putting them back in service; also on the ends of tubes preparatory to placing them for rolling; and for cleaning castings which are too large or fragile to withstand being tumbled. It has been used, to a limited extent for cleaning buildings and rendering window glass opaque.

The cracking coil tubes, pipe, bell caps, trays, header-boxes and similar objects are usually sandblasted out-doors in the open air or in a more or less open shed, both locations being as far removed as feasible from any shops, process units or other working places. Coarse river sand is discharged through a one-half to three-quarter inch nozzle with compressed air under a pressure of 30 to 90 pounds per square inch. The men at the nozzles stand to the windward side of their work and wear a "Healthguard" (Chicago Eye Shield Company) mask, a Sly Sand Blast Helmet or a Fresh Air Hose Mask covered with a canvas hood. The men at the Sand Blast Machines wear "Dust Safe" goggles and a M.S.A. "Comfo" Respirator. The Mine Safety Appliances Company now has a sand-blast hood that is meeting with considerable approval by industry and also by the United States Navy Department. A blower is available for supplying air to these hoods that cleans the air. This same blower can be used in connection with air-line respirators.

When sand-blasting is done inside of drums having more than one opening, such as soaking drums, an air siphon is placed in the lower manhole which draws out the dust and allows a continuous circulation of fresh air through the drum. In drums where the siphon cannot be used, the air circulation is poor and the men work in shifts ranging from 30 minutes to an hour, depending on the size of the drum and the amount of air circulation inside. They also wear an approved sand-blast helmet.

These sand-blasting jobs are not continuous routine operations but are performed when necessary by men selected from the Common Labor gangs or the Mason's Department. The work is rotated so that in most cases it occupies less than twenty per cent. of the worker's time and there is an interval of 15 to 20 days between sand-blasting jobs. Consequently, on the average, no one man is exposed to more than a combined total of 400 hours during the course of a year. In discussing rotation of men on sand-blasting jobs. Dr. Gehrmann, Medical Director of the du Pont Company wrote:

"It must be borne in mind that silicosis is a cumulative disease and, therefore, the rotation of men in this type of work cannot be considered