

The Chemical World This Week

U.K. DISASTER INTUITS CAPROLACTAM SUPPLY

Tragedy struck Nypro's caprolactam operations at Flixborough in the U.K. June 1, when an explosion almost completely demolished production units there, resulting in a loss of 28 lives. Fire raged out of control for several days and many houses near the site were damaged. Financial losses may be as high as \$100 million.

Nypro, owned 55% by DSM of the Netherlands and 45% by the U.K.'s National Coal Board, had a total annual caprolactam capacity of nearly 75,000 metric tons. Because the company was the only British producer of the product, the blast will seriously affect the country's nylon 6 plastics and fibers industries. All raw material for nylon 6 now will have to be imported, and caprolactam supplies are already tight the world over. The accident also will affect fertilizer supplies: about 190,000 metric tons per year of by-product ammonium sulfate were produced in the Flixborough operation. Indications are that Nypro will rebuild, but a new plant is not likely to be completed for at least two years.

Two caprolactam units were located at Flixborough. The newest one, a 50,000 metric-ton-per-year plant costing about \$60 million, started up less than a year ago (C&EN, July 23, 1973, page 7). It was based on an improved process, tradenamed HPO (for hydroxylamine phosphate oxime), developed by DSM's engineering subsidiary, Stamicarbon. DSM's wholly owned U.S. subsidiary, Nipro, Inc., has a 75,000 metric-ton-per-year caprolactam plant at Augusta, Ga., which uses the HPO process. It will double capacity there by late 1976 or early 1977.

It's still not clear what went

wrong at Flixborough. Leshe Granger, Nypro's chairman, thinks the explosion might have involved the highly explosive initial oxidation step, in which cyclohexane is converted to cyclohexanone. But nobody can explain how the explosion and fire could have spread throughout the entire plant in a few seconds unless a combination of circumstances led to the disaster. The only part of the plant still intact, though badly damaged, is that in which cyclohexanone is converted to caprolactam by the HPO process. That leads one DSM observer to guess that that part of the operation didn't trigger the accident. He also points out that the HPO process has been used by Japan's Ube Industries without any problems for the past two years or so.

British nylon 6 makers are still uncertain about how severely they will be affected by the sudden cut-off of a major portion of their feedstock. The U.K. consumes 500 metric tons of nylon 6 polymer annually for plastics production. Courtaulds and British Enkalon, the two major producers of nylon 6 fibers, between them make about 116 million pounds of that product, and plant expansions now under way should raise their combined capacity to about 140 million pounds per year in 1975.

The British blast could affect U.S. caprolactam supplies. Nipro vice president Clem White says DSM in the Netherlands is looking into the possibility of shipping caprolactam from the U.S. to the U.K. "We would certainly exert every effort to be helpful to customers of Nypro in Great Britain," he tells C&EN.

Such help could worsen the current caprolactam shortage in the

U.S., where Nypro already has customers on allocation. Although Mr. White agrees that sending caprolactam to Europe would present problems, he adds that the raw materials pinch, which has cut into production, can't be easing.

The two other U.S. producers of caprolactam, Allied Chemical at Hopewell, Va., and Dow Radische at Freeport, Tex., both have current capacities about double that of Nypro. Both also are expanding their plants. Allied's output is now entirely for captive use. One U.S. market observer, however, thinks DSM will be able to scrape up enough production from the other worldwide plants in which it has an interest to meet the needs of the British market.

EPA asks emission data on vinyl chloride

The Environmental Protection Agency has requested 27 U.S. chemical companies that make vinyl chloride and polyvinyl chloride to provide the agency with "process, emission, and air quality data" on 19 plants by June 11.

In letters to manufacturers dated May 30, EPA says it wants the information "for possible use in the development of air pollution control standards for vinyl chloride in accordance with the Clean Air Act of 1970." At present, no federal air pollution control standards exist for vinyl chloride.

Meanwhile, EPA has been taking samples for the past month near 11 plants to determine amounts of the gas present in ambient air. Public disclosure of EPA's findings is imminent. These findings probably will show existing vinyl chloride ambient air levels near plants to be higher than the levels the Occupational Safety and Health Administration has proposed for inside plants. A likely outcome of all this is that EPA will set an air quality standard near to or identical with the OSHA in-plant standard of "no detectable level."

EPA also wants ambient air quality data collected by the manufacturers near 11 vinyl chloride and 35 PVC plants. Further, EPA wants the manufacturers to identify in each of their plants "any person

Financial loss from blast at Nypro caprolactam works may reach \$100 million

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points in the manufacturing process and the amounts lost from these points, and emission control procedures that have been or could be instituted, and an evaluation of their effectiveness. And EPA wants cost and economic data including the capital and operating costs for each emission control device or procedure. For instance, in the economic data category, EPA wants information such as total investment cost, cost of installation, and operating and maintenance cost, including details on labor costs, capital charges, cost of utilities used, fuel costs, and costs of chemicals and other materials. And the agency requests the companies "give amount and value of any material recovered, both annually and per unit of production."

EPA authority to require submission of such information is contained in section 114 of the Clean Air Act of 1970, which authorizes the agency to "secure any information deemed necessary for development of standards." The agency's letter points out that any information supplied will be made public "unless a satisfactory showing has been made" to the EPA administrator that "the release of the information obtained would divulge a trade secret." In any event, EPA says that emission data "will always be available to the public." And it warns that information cannot be withheld because a manufacturer considers the information to be confidential.

High court reaffirms equal pay for women

The Supreme Court may have written the final chapter to the long fight to obtain equal pay for equal work regardless of sex. Last week in a five-to-three decision, the court found that the Equal Pay Act of 1963 "is broadly remedial, and it should be construed and applied so as to fulfill the underlying purposes which Congress sought to achieve." The court rules that the act's objective in cases where depressed wages are due to discrimination "is not to drag men workers to the wage levels of women, but to raise women to the levels enjoyed by men." This must be done not only as a matter of simple justice to employees, but also as a matter of market economics since wage discrimination on the basis of sex constitutes unfair competition.

A Labor Department official tells C&EN that the ruling will have a

momentous impact on the whole spectrum of pay discrimination cases, since the ruling affirms that there just cannot be any discrimination in this area. He further speculates that the decision will impel many employers who had been dragging their heels to begin looking seriously at their practices in this area.

The decision came in a case brought by the Labor Department against Corning Glass Works, charging them with violating the act by maintaining wage differentials that had their origin in the 1920's between day and night shift inspectors. At that time women day-shift inspectors were earning 20 to 30 cents per hour, but men performing the same work at night had to be paid 53 cents per hour to do what was regarded as "women's work."

The court further ruled that Corning did not achieve full compliance with the act in 1966 when it opened the higher paying night jobs to women, nor in 1969 when the company equalized future pay scales but maintained wage preferences for employees already enjoying them.

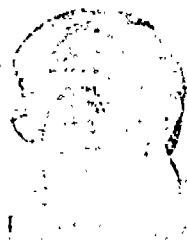
Albert Plant named editor of C&EN

Albert F. Plant has been appointed editor of *Chemical and Engineering News*. He comes to this position from *Industrial Research*, with

which he has been associated since 1968, having been editor since 1972.

Mr. Plant is a graduate in chemistry from Carnegie Institute of Technology and also holds a degree in industrial management from Carnegie. He began his professional career in 1954 with Shell Chemical in Houston, Tex. From 1960 to 1965 he worked with Fisher Scientific in product development and instrument design, after which he became director of research for Kontes Glass, a position he held until joining *Industrial Research*. In addition to his editorship, he was responsible for direction of the IR-100 conference and award competition.

Mr. Plant will assume the editorship of C&EN June 24. He replaces Patrick P. McCurdy, who resigned November 1973 to become editor-in-chief of *Chemical Week*.



Goodyear, Tosco team to recycle scrap tires

Schemes for making use of the 200 million worn-out tires discarded annually in the U.S. have proliferated in recent years—from direct use as offshore reefs for protecting game fish to processing and recovery of the materials in the tires. The latest effort directed toward recovery, revealed last week, teams Goodyear Tire & Rubber with Oil Shale Corp. (Tosco).

The companies are joining in a program to apply Tosco oil shale technology to recovery of energy and re-usable materials from scrap tires. Basically, the program involves further demonstration of scrap tire processing technology that Tosco began developing in 1971 and which it has tested in a 25 ton-per-day pilot plant. A pyrolysis technique, the process involves heating ground-up tires by direct contact with hot ceramic pellets.

In the first phase of the program, Goodyear will supply ground-up waste tires to Tosco's Rocky Flats research center near Golden, Colo. The companies will carry out economic feasibility evaluations, compiling data on the cost of building and operating a recovery system and evaluating the quality of recovered products. The program, the companies say, is expected to lead to commercialization.

According to Goodyear chairman Charles J. Pilliod, Jr., a full-scale scrap tire recovery plant could handle 8 million scrap tires a year and recover enough petrochemicals and other materials to build an additional 2 million tires. Such a plant has the potential for annually turning out 15 million gallons of oil, 73 million pounds of carbon black, and 2 million pounds of steel. The oil, he says, could be further refined.

A major factor most likely on the list of items to be investigated is whether the quality of recovered carbon black is good enough for the material to be useful. Carbon black has been something of a stumbling block in the economics of some recovery schemes proposed by others, since the costs made recovered material economically unattractive, compared to virgin carbon black. However, the new economic climate being created by changes in fuel and feedstock availability and prices should enhance the economics of recovered materials. For example, carbon black users face the threat of substantially higher prices as well as shortages (C&EN, June 3, page 12).

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