

THE FIRST PRIORITY... THE TOP COMMITMENT

Safeguarding Carbiders, Neighbors, The Environment

Some of the very basic objectives of the people of Union Carbide's Texas City plant—to run a safe, clean plant that contributes strongly to the wellbeing of the community—fit perfectly with the goals of the other citizens of Texas City, La Marque and the rest of Galveston County.

We all seek a healthy, pleasant environment as well as the economic advantages provided by one of the most productive petrochemical/refining complexes on earth. Unfortunately, it doesn't come easy. Chemical manufacturing, according to the National Safety Council, is America's safest industry. But this fact is true in spite of some formidable obstacles that face all chemical manufacturers. And keeping workers safe is joined by the challenge of keeping the environment free of pollutants.

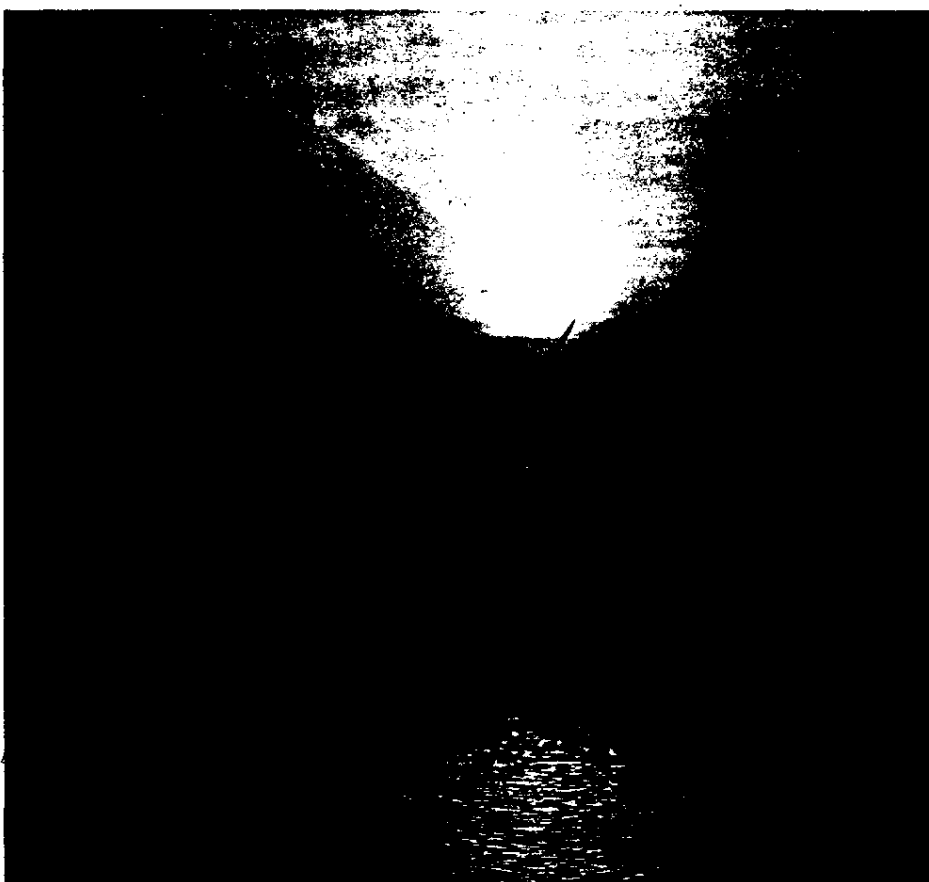
The Challenge

At Carbide Texas City, for example, some 1500 Carbiders use the latest technology and sophisticated equipment to convert petroleum raw materials into 4 billion pounds per year of a hundred chemical and plastic products that enrich the lives of people everywhere. In their manufacturing processes these Carbiders use extremes of heat, cold and pressures in massive, computerized process equipment. Many of their raw materials, products and by-products have varying degrees of combustibility, explosiveness or toxicity—or combinations of these properties.

They are, that is, potentially dangerous materials which must be handled using equipment whose piping, valves, flanges, pumps, etc. present literally hundreds of thousands of potential leak points. And which must be received, processed and distributed without significant releases that could contaminate the environment. Without failures in either equipment or human performance.

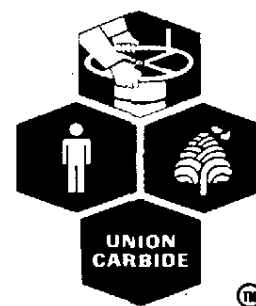
These Carbiders also operate a broad array of maintenance, construction and loading/unloading equipment calling for expertise and constant care in order to prevent serious accidents. It's a challenging

(Continued on p. 12)



A SOLITARY SYMBOL of the environmental quality and beauty all Galveston County citizens seek, a seagull glides over the Bay off Texas City. The new Operation Safeguard® logo, below, symbolizes how Union Carbide operates its Texas City plant so as to protect people and the environment.

PROTECTING PEOPLE OPERATION SAFEGUARD & THE ENVIRONMENT



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PEOPLE WHO KNOW THEIR JOBS—and care enough to do them right—are at the core of Carbide's safe performance. Production, distribution and maintenance people with the skill and motivation it takes to do every job effectively...and safely.

"An Ounce of Prevention"

Avoiding mishaps—equipment failures, leaks, releases, fires—is the best kind of safety action. And this is what Carbide Texas City's process (or operational) safety program is all about. Consistently doing things right the first time, with dependable equipment.

People Who Know ... And Care

Running the 1000-acre Carbide Texas City complex of columns, furnaces, process vessels, compressors, piping, tanks, computers, shops, shipping facilities and laboratories around-the-clock, 365 days a year—and doing it safely—is an extreme challenge. It calls for people who know their jobs, the processes of their particular parts of the plant, and the effects of various actions they might take in a given situation. And who have the motivation and self discipline to do every task correctly... always.

Texas City Carbiders are such people. The production, maintenance and distribution people with the safety-critical jobs have been thoroughly trained on how things work—and why—and on safety precautions. Beginning operators and maintenance craftsmen go through intensive apprentice training programs, and all "Turfs" (operating department) people take part in regular safety and operating procedure update meetings.

The Carbiders running the production units and the distribution facilities know that their own safety and that of their co-workers depends on their correct actions and attention to detail. They are highly motivated to keep the plant running efficiently...

and safely.

Correct Procedures, Carefully Followed

The objective of Texas City Carbiders is to make and ship quality products to customers at competitive prices, and—most importantly—to do so safely. Plant operating procedure manuals, painstakingly developed through the years to detail both plant-wide and specific unit operating standards and procedures aimed at accomplishing this objective, spell out the correct way to run the units. Carbide operating personnel follow these procedures—and contribute to their periodic updating and improvement.

A vital part of risk management is risk analysis: identifying and evaluating the extra risks imposed by particularly hazardous materials, or situations where people could be placed in jeopardy by a mishap. In such instances of critical needs, special procedures and/or equipment are developed to provide that extra measure of safety.

Special procedures aimed at preventing mishaps in the plant include a "master-card" lockout program to ensure that critical valves, etc., are not inadvertently opened or closed during maintenance shutdowns; the reduction of hazardous-material inventories over the past few years; the thorough pre-trip inspection of tank trucks and rail cars prior to shipment, to guard against product leakage in transit; and a plant-wide program of spill and leak prevention.

**THROUGH
TRAINED PEOPLE,
CAREFUL PROCEDURES
SAFE EQUIPMENT**



REAL UNDERSTANDING of how the plant works and how to keep it running safely starts with the intensive training received by all beginning operators.



VITAL INSURANCE against accidental opening or closing of valves or equipment startup during repair turnarounds is provided by a "master card" lockout system.

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Equipment You Can Rely On

Safety is designed-in and built-in at Carbide. All production equipment is engineered—and components specified—with long-range safety in mind. Safety is one area where dependability is valued much higher than economy. In fact about 12 to 15 per cent of the cost of new facilities is spent on safety-related features. In critical-need areas, such as units handling highly corrosive fluids, special materials such as stainless steel may be specified.

This initial soundness is enhanced by an ongoing program of equipment maintenance designed to prevent operating failures. In the plant's Reliability Maintenance Program—a joint effort of Operations and Maintenance people—key elements of operating and safety backup equipment are regularly inspected, and repaired or replaced as needed. Test & Inspection specialists use electrical, magnetic and ultrasonic equipment and other techniques to inspect important items such as safety valves, reaction vessels and storage tanks for structural soundness.

Two plant-wide programs important to the prevention of mishaps are the continuing upgrading of the electric power distribution system, and the network of combustible-gas

detectors designed to provide an early warning of any significant leak.

Safe people, safe procedures and safe equipment. The right combination for preventing mishaps.



DISTRIBUTION SAFETY—Tank cars and trucks are thoroughly inspected prior to leaving the plant, to help ensure a safe trip to customers' locations.



RELIABLE EQUIPMENT begins with careful design and engineering, and continues with a Reliability Maintenance program which sees to the regular inspection of critical safety and operational equipment components. Test & Inspection specialists check vital underground pipelines (left); use a variety of structural soundness techniques (above) to detect potential problems.



PROTECTIVE SYSTEMS designed to minimize the effects of mishaps include banks of storage batteries (above) to keep critical instrumentation working during possible power outages, and a plantwide system of explosive gas detectors (below), on guard around the clock.



IMPORTANT EQUIPMENT such as this pipeline instrumentation transmitter is routinely checked and repaired or replaced.

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Keeping People Safe And Well



PART OF EVERY JOB, EVERY PROJECT is the safety and environmental protection planning and awareness that helps Texas City Carbiders protect themselves and their community neighbors.

People Head the List

The advanced technology embodied in Carbide Texas City's impressive facilities makes the plant an industry leader ... but it's the 1500 highly capable people who run the plant that make the big difference. They are the plant's greatest asset—and their safety and health are first priority with its managers.

A Safe, Healthy Environment

Safe, comfortable working conditions for all Carbiders is one of the plant's continuing objectives. Carbide's Industrial Hygiene people keep a close watch on conditions under which plant employees function. They use several types of vapor analyzers to monitor possible leak areas, and a network of air sampling "badges" worn by designated employees checks the breathing conditions in various parts of the plant on a strategically planned basis. Samples taken in these and a variety of other ways are analyzed in an ongoing program which monitors potential exposures of Carbiders to unfavorable levels of vapors, noise, heat, radiation... any possible threat to their health.

Safety Equipment... the Finest

To protect Carbiders on the job the plant uses a seemingly endless variety of safety headgear, eye and hearing protectors, fire, water and chemical-resistant clothing and footwear, portable breathing apparatus for both planned and emergency use, and fall-prevention gear for working in high places. This personal safety equipment is the most effective and up-to-date money can buy, and is augmented by instantly-operational safety

showers and eye baths located at strategic points throughout the plant, and several kinds of portable fire extinguishers.

Careful Work Procedures

Carbiders are trained and required to use this array of equipment correctly, and to follow carefully-developed procedures for all working conditions ... including such special situations as entering vessels for maintenance work. Safety planning is a part of each and every undertaking at Carbide.

Promoting Health and Fitness

With the conviction that a healthy Carbider is a safer, more efficient and happier person, the plant's well-equipped Health Services facility conducts extensive health education, screening and fitness programs in addition to its regular physical exams, general health care, emergency first aid care and employee assistance.

Off-the-Job Safety

In 1986 Texas City Carbiders set an all-time plant safety record when they reached 6 million-plus workhours without a disabling injury. Most of them consider their off-the-job activities to be more dangerous than being at work in the plant... and injury records bear this out.

To help Carbide employees face the hazards of being off duty, the plant conducts an educational program aimed at teaching Carbiders and their family members how to apply some of their proven plant safety policies to their sports, hobby and highway activities. Proper lifting, the use of eye pro-

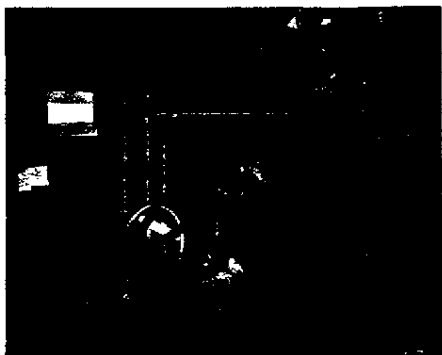
**ON THE JOB,
ON THE ROAD,
AT HOME**

tection and defensive driving training are some of the subjects taught in an effort to make Texas City Carbiders as safe outside the plant as they are when they're at work.



THE WELL-DRESSED CARBIDER on the job has at his or her disposal a complete range of high-quality protective clothing, headgear and other personal safety equipment.

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BREATHING APPARATUS for emergency use is located strategically throughout the plant. Other respiratory gear is provided for special situations such as vessel entry.

CHECKING FOR LEAKS of vapors is one of the many monitoring activities of the plant's Industrial Hygiene specialists, who also monitor dust, noise, heat.



AIR-SAMPLE ANALYSIS in the Industrial Hygiene lab helps keep watch for any potentially harmful materials. I.H. also monitors noise, heat and radioactivity levels to help ensure safe working conditions in the plant.



INSTANTLY AVAILABLE in all production and lab areas are these dependable safety shower and eyewash units.



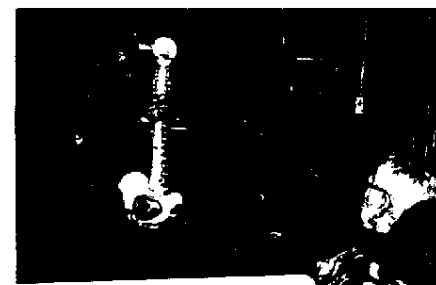
THE HAZARDS OF LEISURE—A program of Off-the-Job Safety helps Texas City Carbiders apply many of their safety principles to sports, hobby and highway activities.



TRAINED AND EQUIPPED to work carefully and safely, Carbiders conduct a wide variety of jobs effectively, and have recorded more than six million workhours without a disabling injury.



FOR THE HEALTH AND FITNESS of Carbiders, the Medical Services Division both conducts continuing exercise programs (above) and operates a fully-equipped medical facility (below) offering regular physical exams, emergency first aid care and health education programs (bottom photo). (The runners are using the quarter-mile jogging trail at Carbide Corner Park.)





READY FOR PROBLEM SITUATIONS WHEN THEY OCCUR

THE SHIFT EMERGENCY DIRECTOR calls the shots during a real emergency. He has at his fingertips immense resources in people and equipment to resolve a problem situation for the safety of Carbide's and the community. The Shift Emergency Directors and the Fire Chief comprise the plant's strategic Emergency Response Management Team.

Even with an all-out program aimed at preventing mishaps, they can still happen. And so Carbide Texas City goes to great lengths—via training, practices and drills—to be ready for the worst, while hoping their full expertise is never needed. "Fortunately," says a safety engineer in the plant, "we just don't have real plant emergencies often enough for our people to become experienced in handling them."

And so plant emergency people rehearse their procedures and hone their skills with simulated emergencies and practice drills, some internal and some involving community agencies and other industries. And the plant's strategy/planning Emergency Response Management Team—comprised of the Shift Emergency Directors and the Fire Marshall—continually strives to improve response techniques and equipment.

Emergency Drill: No Small Thing

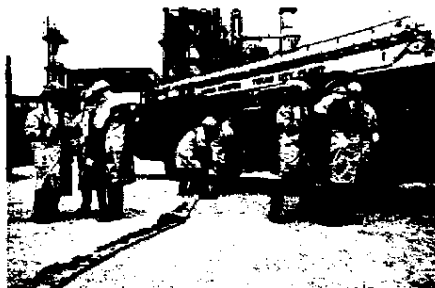
As in a real emergency, a full drill at Carbide Texas City is an impressive thing to see. An emergency alarm during a weekday is answered by close to 70 people, including the Shift Fire Squad, volunteers and Emergency Medical Technicians. The fire truck, ambulance and other emergency equipment are the best available. And the crews are well-trained and very serious about the responsibility they carry.

EOC: Making the Right Things Happen

In a real emergency at Carbide, the plant's Emergency Operation Center (EOC 1) springs into action, headed by the Shift Emergency Director and staffed by managers who collectively have the know-how and authority to do whatever's called-for to help solve the problems. EOC 1 is equipped with complete telephone and radio communications equipment (including hot lines to police stations, and the Emergency Alert

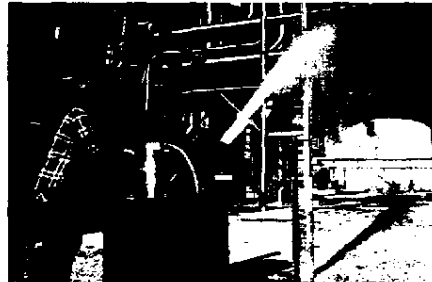
Radio System—"EARS"), as well as emergency information, maps of surrounding communities and vapor dispersion charts. With the shift emergency director calling the shots from the emergency scene, the EOC 1 managers take whatever actions are necessary to rectify the emergency and to safely return the plant to normal.

In a severe emergency, threatening other industries or communities near the plant, "EOC 2" can be mobilized. Operating in conjunction with EOC 1 and located in the same building, EOC 2's team includes specialists in communications and community relations. Whereas EOC 1 is designed primarily to handle emergencies in the plant, EOC 2 is aimed mainly at helping concerned entities outside the plant, and works



FIRE PROTECTION AT CARBIDE is about as good as it gets. Fully equipped emergency squads hold regular, realistic drills (left), and undergo intensive, realistic training (below). Carbide firefighters also help nearby industries and communities as needed.





BUILT-IN EMERGENCY EQUIPMENT in the units includes spray monitors (left) and deluge systems (right) that can be quickly put into



operation to minimize leak situations as well as fight fires.

to minimize the impact of any possible emergency on the plant's neighbors.

Mutual Assistance in Emergencies

Problem situations in the Texas City area often bring industries and communities even closer together. Carbide's emergency crews, for example, often help other industries and communities via the Industrial Mutual Aid System. Other members' emergency equipment crews are also available to Carbide, should they be needed. Carbide and other industries work together in the CAER program as well, helping to develop joint community response procedures. Carbide and other companies also share data on incidents (mishaps) which occur, in the interest of helping one another avoid similar mishaps in the future.

READY FOR WHATEVER COMES ALONG. Carbide's firefighters are well-equipped, thoroughly trained, and respected in the field.



HELP for Hazardous Material Leaks

Carbide is well-equipped to handle emergencies in the plant and—when needed—out in the community. Its HELP team, part of the nationwide network of Carbide HELP (Hazardous Emergency Leak Protection) team units, is available around-the-clock to handle leaks of hazardous materials in transit.

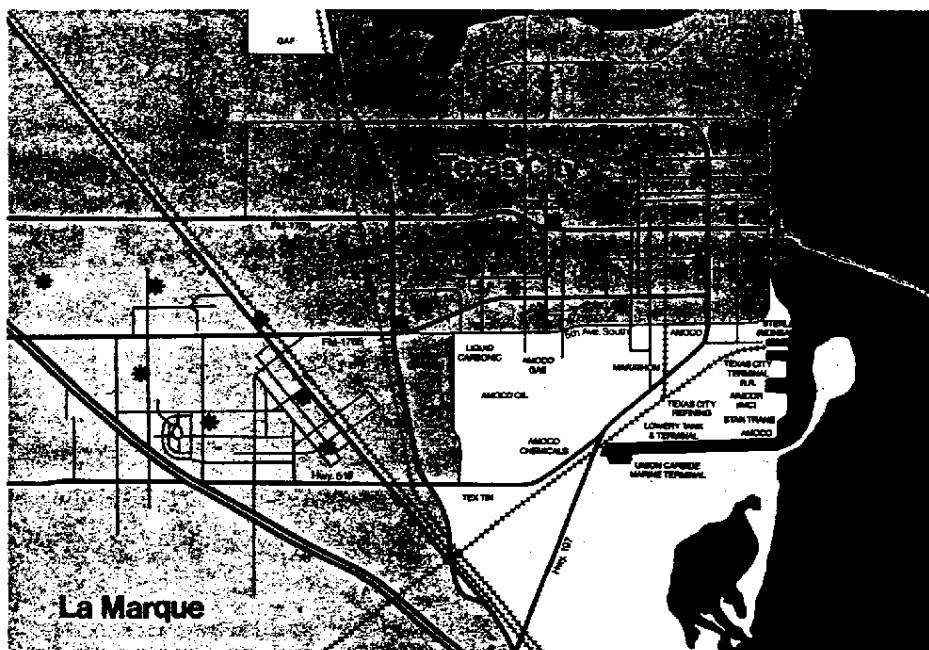
The Texas City plant's HELP Team is comprised of highly-trained people and a team vehicle equipped with all the tools and devices needed to handle leaking drums, tank cars, and trucks ... wherever they may be.

HELP FOR HAZARDOUS LEAKS—The Texas City HELP (Hazardous Emergency Leak Protection) Team is one of a nationwide network of Carbide HELP units available 24 hours a day to handle leaks of hazardous materials in transit.



EXPERT EMERGENCY CAPABILITIES at Carbide include fully accredited Emergency Medical Technicians and an ambulance outfitted with state-of-the-art paramedic equipment and supplies. Their know-how is impressive, and reassuring.





CARBIDE PART OF CAER PROGRAM DESIGNED FOR YOUR SAFETY

YOUR ALERT SYSTEM—The network of 16 rotating sirens blanketing the Texas City/La Marque area is your early warning system in chemical emergencies.

The map above and the aerial photo on the next page show the extent and intensity of the Texas City industrial complex. Wall-to-wall chemical plants and refineries all the way from Union Carbide on the west to Sterling Chemical on the east, fronting on Galveston Bay. Sophisticated and productive plants run by responsible people who know what they're doing... but complete with all the potential dangers already outlined here.

Being ready for emergencies has been a way of life here from the beginning. Following the marine-centered tragedy of 1947, the plants and the public-sector emergency units joined forces to form the Industrial Mutual Aid System (IMAS), under which any member can reach out for fast, expert help from the others in handling major emergencies. IMAS is still a strong, proven safety force in Texas City.

Following the 1984 Bhopal tragedy—which introduced a new level of potential disaster—industry and the public everywhere took a long look at their preparedness for emergencies. A major result is CAER—Community Awareness and Emergency Response, sponsored by the Chemical Manufacturers Association, the Texas Chemical Council, and local petrochemical industries.

The objective of CAER nationally has been to improve the protection of public health and safety by developing public hazardous-material awareness programs and integrating industry and community emergency response planning and procedures. To help people to understand and cope with chemical emergencies.

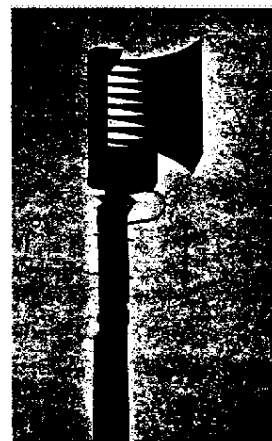
The Texas City/La Marque CAER program is one of the most advanced and suc-

cessful anywhere. Sponsored by industry, with the input of local and county emergency and health entities, our CAER program has developed emergency response plans, installed a \$300,000 warning siren system, and conducted a public education program on how to react in emergency situations.

Union Carbide is proud to have been a leading participant in both the IMAS and CAER programs.

The CAER Participants

Local membership includes: AIMCOR Marine Terminal; Amoco Chemical Company; Amoco Gas Company; Amoco Oil Company; GAF Chemicals Corporation; Marathon Petroleum Company; StanTrans, Inc.; Sterling Chemicals Company; Texas City Refining, Inc.; Texas City Terminal Railway Co.; Union Carbide Corporation; Cities of Texas City and La Marque (Fire and Police Departments, Civil Defense, School Districts); Galveston County (Civil Defense, Emergency Preparedness Office, Health District and Water Authority); hospitals (AMI Danforth, Mainland Center, St. Mary's, UTMB-Galveston, Galveston County EMS, Inc.); and media (KGBC-AM, KILE-AM and KTRH-AM radio, *Texas City Sun*, *La Marque Times*, *Galveston Daily News*).



LOUD AND CLEAR—The high-intensity sirens provided by industry for the community carry a long way. Make sure your family knows what to do when the sirens sound.

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THE TEXAS CITY/LA MARQUE ENVIRONMENT—A sprawling petrochemical complex with neighboring residential areas immediately to the north and west, and critical bodies of water to the east and south. An area where clean air and water, and uncontaminated land, are vital to everyone. Galveston Island is visible at top right of photo.

Carbide's Texas City plant, in the photo above, is the closest facility to the viewer. It extends from Highway 146 at the bottom of the picture eastward to Grant Avenue (that left-to-right road with the jog in it about 1½ inches above the bottom), and all the way from 5th Avenue South (at the left extremity) to Highway 519 (at extreme right). The Texas City Industrial Canal is toward the upper right of the picture, and Carbide's Marine Terminal includes its own Turning Basin (the bottom of the L-shaped body of water).

A Lot to Say Grace Over

With a total of a thousand acres of tanks, columns, piping, process vessels, loading facilities and more, Carbide has a lot to watch over. Many of the materials it handles are hazardous in terms of fire, explosion, reactivity or health effects, and—in spite of a vigorous hazardous-inventory reduction program—the plant may have hundreds of millions of pounds of such materials on hand at any given time.

The challenge of safeguarding these inventories in place is multiplied by the need to unload, transfer, process and ship them. Carbide Texas City, for example, each month loads 80 barges, 15 ocean-going tankers, 500 tank trucks, 350 rail cars and 8500 chemical drums. In doing so Carbiders use 5000 feet of transfer hose and 400 connectors. The chances for spills, leaks and gaseous emissions are increased by the sheer amount of equipment involved,

including some 500 tanks and process vessels, 25,000 valves (including more than 7600 safety valves), 75,000 flanges, 500 pumps, 100 compressors, 50,000 tubing connectors, and a thousand miles of pipe in the plant proper and Marine Terminal. Emissions—with gases under pressures up to 2000 pounds per square inch—are a constant possibility.

Even the plant's cleanup operations, with almost 500 vacuum truck usages per month, require great attention to avoid releases to the environment.

How do Texas City Carbiders succeed in controlling all these valuable, useful but

THE AIR, WATER, LAND WE ALL SHARE



HELPING KEEP THINGS CLEAN—The Texas City Dike, a five-mile finger of land visible at the top of the aerial photo on this page, is one of the Galveston County public recreational areas in which the Carbide Volunteers have placed trash barrels to help fight litter.

potentially dangerous materials over the long haul? Part of the answer is quality in Operational Safety—doing things right the first time, all the time (see pp. 2-3). The rest of the story lies in the Environmental Protection program outlined in the next four pages.

Carbide & SARA Title III: Same Basic Objectives

"SARA Title III"—a federal law much in the news these days—is designed to ensure the safety of communities and to protect their environment. Protecting people and the environment is also the top priority of Union Carbide Corporation and its Texas City plant. And both the corporation and the plant have strong, proven track records in safety and environmental protection.

Title III—also known as the "Emergency Planning and Community Right-to-Know Act of 1986"—calls for the establishment of emergency plans (such as the CAER plan), notification of state and local bodies of releases of hazardous substances, filing of MSDS (material safety data sheets), reporting of toxic inventories kept on hand, and reporting of the release

of toxic materials to the environment over an extended period.

Like other responsible chemical industry operators, Carbide Texas City has complied with all Title III requirements to date, and will continue to do so. At Carbide we see Title III as both a responsibility ... and an opportunity to close any communication gap that may exist with neighbors, government officials—even Carbide employees themselves.

In our mind, Title III marks the beginning of a meaningful dialog among communities, industries and local officials about chemicals and the safe operation of industrial facilities. The resulting increased understanding should benefit everyone.



COMPUTER POLICING OF AIR QUALITY—Carbide Texas City Environmental Protection specialists use state-of-the-art emissions "modelling" techniques to project the effects of material emissions on downwind areas.

At a glance a chemical plant such as Carbide Texas City seems to be a closed system—with all the chemicals safely tucked into tanks, pipes, and vessels and none of it getting loose into the air, or dropped on the ground or into nearby waterways. And this is how it's designed to be.

But in real life the odds take their toll: The previously-mentioned transferring of materials and opportunities for pressure leaks—combined with not-yet-perfected production technology and the inevitable occasional incident caused by human error or equipment failure—mean that there will be some releases to the environment of materials which can cause odors or, in sufficient concentrations, constitute a hazard to people, animals or plant life.

Government agencies recognize this imperfect state of the industry, and issue permits for what they consider safe levels of emissions from plants on an ongoing basis.

At Texas City Carbide these permitted levels of air emissions, for example, are viewed as the bare minimums of performance. Carbide's own standards are much more stringent—and preventing and controlling leaks, spills and emissions is a basic part of the job of everyone involved in production and distribution.

Environmental protection equipment and techniques represent a significant part of the Texas City plant's investment in production facilities, and about 1/3 of current engineering project efforts are directed at environmental, safety and health improvements. The plant has invested more than \$30 mil-



AIR PURITY at Carbide is protected by such equipment as smokeless safety flares (left) and smokeless incinerators for cleanly disposing of organic acids.



POTENTIAL TOXIC LEAK points such as this benzene valve are regularly checked as part of a "Directed Maintenance" program. Such care helps prevent air pollution, protect Carbide employees.



lion in environmental protection equipment, and annually spends more than \$10 million to operate such protection efforts.

It Begins in the Plant ...

The plant's Industrial Hygiene people—who, as discussed, monitor air quality, noise, heat, radiation, etc., within the plant—work as a team with the Environmental Protection specialists, who are concerned with conditions beyond the fence line, throughout the community.

... and Extends Everywhere

Carbide's environmental objective, as mentioned, goes beyond simply meeting the requirements of governmental agencies. The plant strives to reduce air emissions to the lowest level practical, and for the best possible cleanup of wastewater and the most effective handling of solid waste and

KEEPING SOLVENT VAPORS from being released to the atmosphere is the function of the "carbon beds" at Solution Vinyl Resins.



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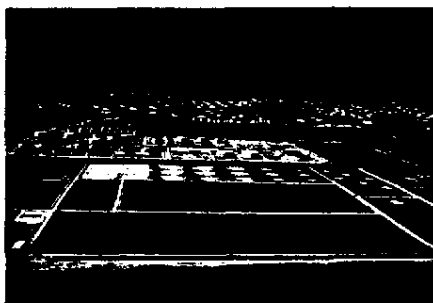
SUBSURFACE FLUIDS beneath the plant are monitored via a network of test wells from which samples are regularly drawn and analyzed.



toxic materials. In a chemical manufacturing operation this is a tall order—but the plant works continually toward this end, using its extensive technological capabilities to monitor and analyze air and liquid samples, and to develop better operational methods. Its air sampling program, for example, extends throughout the community, where Carbide is a lead participant in the Texas City Ambient Air Monitoring program (TCAAM). And its new program of emissions modeling uses sophisticated computer techniques to predict the downwind "plumes" that would develop from emissions to the air under varying conditions of wind, temperature and humidity.

Carbide's Pollution Solutions

The plant's air purity protection program includes a smokeless incinerator for burning organic acids, the use of scrubbers to remove impurities from gases leaving the units, and floating-roof storage tanks for adjusting to varying liquid levels while minimizing the venting of vapors. Air protection also includes the use of carbon beds to recover solvents at the Solution Vinyl Resins unit, to avoid releasing them to



CARBIDE'S WASTEWATER TREATING is completed at the advanced 40-acre facility of the Gulf Coast Waste Disposal Authority adjacent to the plant's Marine Terminal.

the atmosphere; and smokeless flares, for safely disposing of temporary surpluses of materials without polluting the air.

Various kinds of collection devices keep vapors from storage tanks and barge-loading operations from reaching the air, and scrubbers similarly protect tanker-loading operations.

Conditions under the plant are also closely monitored, through a network of 40 wells, 20 of which are regularly sampled and tested, to check the composition of fluids in the subsurface. No waste materials are injected into the ground.

Carbide's wastewater treatment starts with skimmers and clarifiers to remove solids, and proceeds to the highly advanced 40-acre water-treating facility run by the Gulf Coast Waste Disposal Authority—near Carbide's Marine Terminal—which treats wastewater from Carbide and several other industries in a series of bacterial and aeration ponds to make it safe for return to the environment.

The Gulf Coast Waste Disposal Authority's licensed landfill just south of the water

KEEPING TOXICS SAFELY CONTAINED should their tanks fail. That's the purpose of the special levees which surround critical storage tanks at Carbide.



treating facility receives about 90% of Carbide's solid waste sent out of the plant, along with those of other industries. These facilities are professionally managed for maximum environmental protection.

Carbide Texas City has also made considerable progress recently in the minimization of waste materials, through increased operational efficiency and the recycling of materials. Such minimization obviously helps solve problems before they become problems.

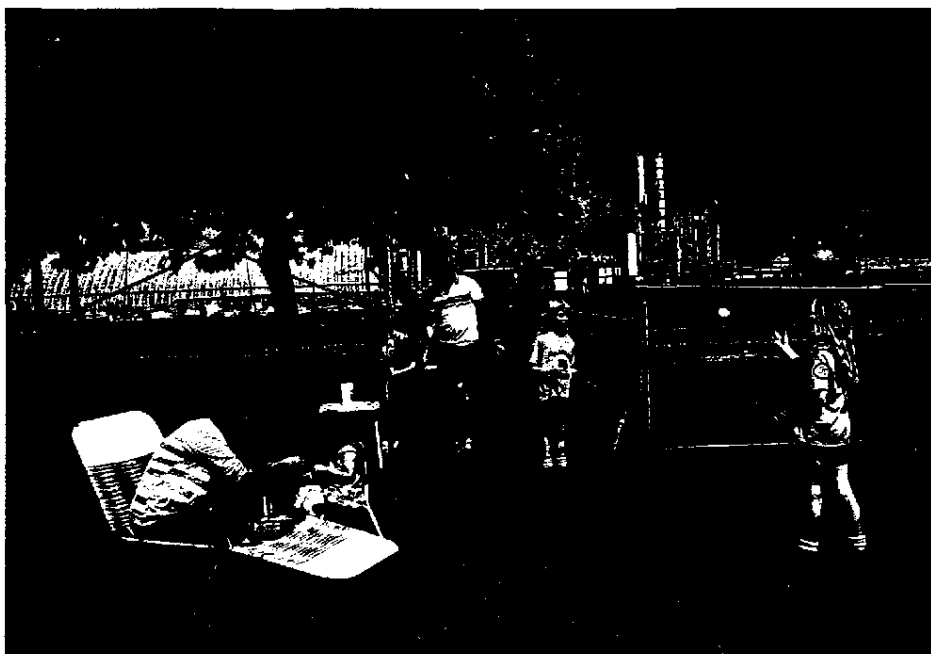
VAPOR RECOVERY UNIT in the isopropanol storage area includes a refrigeration system which chills gases and returns them as liquids, rather than venting to the atmosphere.



CARBIDE PROTECTS THE AIR from chemical vapors by using floating-roof storage tanks—such as this one at the Marine Terminal—whose capacity changes as they are emptied and refilled.



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CARBIDE NEIGHBORS RELAXING—The Bert and Judy Henderson family, who live not far from Carbide's Olefins Unit. While Judy entertains Tracy, 3, and Bert receives barbecue advice from 5-year-old Kristen, twins Rachel and Dana, 8, hone their softball skills.

Bert and Judy Henderson of La Marque, who live immediately west of the Carbide Texas City plant, say living that close is no big deal. An occasional light odor, a loud noise once in a while, and a night sky brightened by a safety flare. But mostly pretty quiet. And, as Judy puts it, the plant at twilight, when the night lights first come on, is downright pretty.

A cross-sectional group of other neighbors, invited into the plant for an open discussion of concerns and interests, were of a similar view, although they had more to say. They had more questions than criticisms—and their strongest criticism was that

Carbide hasn't communicated well enough with its neighbors and others in the community.

The plant is now at work on rectifying that admitted shortcoming, and providing those neighbors with the answers to their questions.

The Downwind Air Quality

In 1985 Union Carbide Corporation committed to a company-wide reduction in toxic emissions of 30% per year for three straight years. The Texas City plant, already embarked on a reduction program, hasn't quite achieved those numbers, but has

Operation Safeguard (Cont'd from p. 1)

activity requiring the very best efforts of all participants.

The Commitment

Union Carbide Corporation—a leader in safety and environmental protection throughout its 70-year history—further crystallized its resolve following the 1984 Bhopal tragedy, and today is committed to being second to none in protecting people and the environment. And the Texas City plant—with nearly a half-century of safe operations to its credit—shares this corporate commitment. As plant manager Foley S. Provenzano puts it, "We will not compromise the safety of people or the quality of the environment for production or profit. Protecting these priceless resources is our top priority."

The Mechanism

Carbide's Texas City plant has some of the most highly-developed and successful safety/health/environmental programs in the business. For simplicity the plant has recently developed a name/graphic identity that combines the four basic activities into a single thought ... "OPERATION SAFEGUARD: Protecting People & The Environment."® Operation Safeguard is comprised of Operational Safety, Personnel Safety and Health, Emergency Response, and Environmental Protection. Together these programs strive to prevent mishaps of all kinds, protect Carbiders from injury on and off the job, efficiently manage emergencies when they do occur, and protect the environment by preventing releases of raw materials, products or byproducts.

Operation Safeguard, then, summarizes Texas City Carbide's top priority.

THE BOTTOM LINE: THE AIR YOU BREATHE, THE WATERS YOU FISH

Hazardous Materials Information

Carbide Texas City plant Materials Safety Data Sheets (MSDS), recapping the properties of all materials handled by the plant, are available in book form for your review at the Texas City Public Library, La Marque Police Department, Galveston County Health Department, and Union Carbide/Gate #2.

made marked improvements. And it shows. Initial computer modelling of emissions indicates a concentration of plant chemicals outside the plant of only 1 to 2 parts per billion—far below all government and industry standards. Plant environmental awareness programs and equipment improvements also resulted in a 30% drop in significant chemical spills from 1986 to 1987.

Gone With the Wind

Try as they may, plants such as Carbide Texas City may lose thousands of pounds of toxic chemicals per year to the atmosphere. Fortunately, these emissions—like those from cars, trucks, planes, gas stations, fireplaces, outdoor cookers and natural sources—typically are quickly diluted by the air, and dispersed by the winds, resulting in parts-per-million (or less) concentrations even a short distance from the emission source.

Parts Per Million, etc.— A Perspective

To visualize one part per million, picture a solid line of cars stretching the 2500 miles from San Francisco to Cleveland, Ohio. One car would be a part per million. If the line of cars could be extended around the world a hundred times ... one car would be a part per billion.

Texas City/La Marque General Air Quality

A one-year monitoring study by the Texas Air Control Board—measuring quantities of acrylonitrile, arsenic, benzene, ethylene oxide, lead, vinyl chloride and other toxics in Galveston, Harris, Jefferson and Orange Counties—including a test site in Texas City—showed no indication of health risks in these industrial areas. Levels detected were typical of heavily-urbanized areas across the U.S.

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