

Deer Park Community Advisory Council

Question of the Month

Table of Contents

- Pg 2 Question 1. What Are Flares
- Pg 2 Question 2. When a Truck/ Railcar Leaves a Plant Site, Who is Responsible?
- Pg 2 Question 3. What Is Underground Injection of Hazardous Aqueous Waste in Deepwells?
- Pg 3 Question 4. How Does the Industry Prevent, Mitigate and Control Their Impact on Our Community/Environment?
- Pg 3 Question 5. What is an OSHA Recordable Injury?
- Pg 3 Question 6. What Is API and Its Significance to the Oil and Gas Industry?
- Pg 4 Question 7. What Is Burned in an Incinerator?
- Pg 4 Question 8. How Does the Manufacturing Industry Manage the Safety of Contractors?
- Pg 4 Question 9. What are OSHA's Standard Interpretation Letters?
- Pg 5 Question 10. How Important is the Chemical Industry to the Texas Economy?
- Pg 6 Question 11. What is the difference between standards and regulations?
- Pg 6 Question 12. How do you prevent heat-related illness during the summer months?
- Pg 7 Question 13. What is the Chlorine Institute?
- Pg 7 Question 14. What is Responsible Care?
- Pg 8 Question 15. What do you do for Shelter in Place?
- Pg 8 Question 16. What challenges does freezing weather pose to a plant?
- Pg 9 Question 17. How does a hazardous waste facility know what a consumer sends them for disposal at their facility?
- Pg 9 Question 18. How do local chemical plants safeguard their critical processes and hazardous materials?
- Pg 9 Question 19. What is Process Safety Management (PSM)?
- Pg 10 Question 20. What is a turnaround?
- Pg 11 Question 21. What is a characteristic hazardous waste?
- Pg 11 Question 22. What does a plant do when a hurricane is predicted?
- Pg 12 Question 23. What is petrochemworks.com and how is it helpful to the community?

Pg 12 Question 24. What is a chemical?

Pg 13 Question 25. What does “organic” mean in our industry vs. others?

Pg 14 Question 26. Why do we need chlorine?

Pg 14 Question 27. What do the emergency response terms “Incident Commander” and “Unified Command” mean?

Pg. 15 Question 28. How do you shelter in place?

Pg. 15 Question 29. How do I sign up for Code Red?

Pg. 16 Question 30. What steps do you take to prevent a spill?

Pg. 17 Question 31. What is sustainability?

Pg. 17 Question 32. How is Metal Thickness Measured to Assure Plant Equipment Stays Fit for Service?

Question 1. What Are Flares

Answer: Flares are safety and environmental devices designed to safely burn off excess gas from chemical plants or refineries. At the March 2016 meeting, one of the DPCAC plants explained the following and provided the attached diagrams of equipment from which gases may be routed to a flare. A flare is a safe and environmentally friendly alternative to sending excess gas to the atmosphere. It works similar to burning natural gas on a stove top. Flares are designed with a pilot device that ignites the gas exiting the system to ensure the hydrocarbons/chemicals are safely combusted into carbon dioxide and water vapor before entering the atmosphere. Flare pilots stay lit (similar to water heaters) at all times. Size and brightness of the flame depends on the amount of gas going to the flare. Flares are used primarily in two situations: Emergency – process flow is interrupted by an emergency (equipment or power outage), the excess gas goes to a flare. Startup/Shutdown - flares help the plants safely manage the wide range of gas production that can occur. (#1 -- March 2016 – Dow Deer Park)

Question 2. When a Truck/ Railcar Leaves a Plant Site, Who is Responsible?

Answer: Industry is often asked who is responsible for cleaning up a spill once a truck or railcar leaves an industrial facility. Regulations lay out who is responsible for what. According to Texas Commission on Environmental Quality regulations, if a truck or railcar has left a manufacturing facility and is in an accident that causes a container to break open and spill chemicals, the owner or operator of the truck or railcar is responsible to initiate spill containment and clean up. However, the manufacturer of the chemical still needs to provide expert advice on response and containment by providing Safety Data Sheets (SDS) or assisting with cleanup. The TCEQ may step in and conduct cleanup if they think cleanup is inadequate and then send a bill

for their services. Many Deer Park CAC plants are members of the American Chemistry Council and thus committed to its Responsible Care program, whose principles call for exercising stewardship in various ways over the lifetime of the products your company makes. (#2 -- April 2016 – Evonik)

Question 3. What Is Underground Injection of Hazardous Aqueous Waste in Deepwells?

Answer: Underground injection of hazardous waste is a widely used management method for hazardous waste disposal. “Deepwell” use is governed by EPA and State regulations as well as stringent permitting, design, and operational requirements. The EPA instituted the Underground Injection Control (UIC) program for the purpose of protecting Underground Sources of Drinking Water (USDW). Additional regulations were added to injection wells that injected hazardous waste. They include what is commonly known as a “10,000 year No Migration Petition.” These permits are very strict in terms of the geologic criteria where injection can occur. Only geology that confines the injection between impermeable layers like shale is allowable. Injection wells are designed with concrete and steel casing to protect any potential underground water sources. A separate annulus between the casing and the injection pipe is filled with fluid which is kept at a higher pressure so that, even in the event of a leak, the injection fluid will be injected. (#3 -- May 2016 – Texas Molecular)

Question 4. How Does the Industry Prevent, Mitigate and Control Their Impact on Our Community/Environment?

Answer: When it is determined that the environment or local communities may be affected by industrial activities, it is necessary to address potential impacts through the application of appropriate prevention, mitigation control and management measures. Different technologies and approaches can be used depending on the local circumstances. but there is no one "right technology or practice" that can apply to all situations. Specific measures can be applied to prevent or limit impacts within the response and remediation capabilities to the environment. For example, the petrochemical industry works in partnership with government agencies to prevent spills and maximize emergency preparedness and response.

Examples of specific measures include the following: metrics to measure performance, product stewardship; haz-com (hazard communication) training; management of waste streams; methods to keep up with regulations and laws; feedback from interested parties, the community, DPCAC, and Deer Park Local Emergency Planning Committee (LEPC); employee training; sustainability efforts; “meet and exceed” goals. (#4 – August 2016 – Valvoline)

Question 5. What is an OSHA Recordable Injury?

Answer: OSHA, the federal Occupational Safety and Health Administration, regulates workplace safety for all of private industry, both goods-producing and service-providing. OSHA also has some data on safety in state and local government. A “recordable” is a work-related injury or illness that must be *recorded* on an OSHA log, which must be available if OSHA

inspects. Fatalities must be *reported*, not just recorded, as must inpatient hospitalization, amputation, and loss of an eye. In simplest terms, an OSHA recordable is an injury requiring a doctor's intervention. The range is wide. A recordable could be as simple as being given prescription medicine or as serious as surgery. The worst cases would be fatalities. Lost-time cases occur when the worker is unable to come to work. Restricted duty cases are those in which the person can work but not do his or her usual job. Other recordables are less serious injuries. The OSHA recordable rate, used for all kinds of business, is based on 200,000 work hours, the number worked by 100 people in 12 months. The number of hours worked at a specific business affects its recordable rate. In a big company, one injury may produce a rate of less than 1 per 100 injuries in a year. In a small company, one injury results in a high rate. The chemical industry typically has better recordable rates than manufacturing as a whole and safer than education and health services. (#5 – September 2016 – Facilitator)

Question 6. What Is API and Its Significance to the Oil and Gas Industry?

Answer: API is the American Petroleum Institute, a national trade association representing all segments of the oil and natural gas industry. Its 625 member companies include producers, refiners, suppliers, marketers, pipeline operators, marine transporters, and the various service and supply companies that support the industry. For more than 85 years, API has developed standards and recommended practices to promote the use of safe interchangeable equipment and proven and sound engineering practices. Many of these 685 standards and recommended practices have been incorporated into state and federal regulations, and some are used globally. Typically, API standards are updated every 5 years, incorporating the lessons learned by member companies' experiences. API also issues weekly statistics on oil and gas inventories, production, imports, and capacity. Click here for details. (#6 – October 2016 – Shell Deer Park)

Question 7. What Is Burned in an Incinerator?

Answer: Clean Harbors is a permitted incineration facility in Deer Park that stores and treats hazardous, non-hazardous, Toxics Substances Control Act, and medical waste. Clear Harbors also provides incineration services for witness burns to the Drug Enforcement Agency, Department of Homeland Security, and various police forces. One of its kilns can burn 20,909 lbs/hr of waste at 1906° Fahrenheit or more and 16,848 lbs/hr of liquids in its afterburner at 2112 °F. A second kiln can burn 23,545 lbs/hr at a normal operating temperature of 1968 °F. The rotary reactor kiln can handle 15,892 lbs/hr of soils and other materials at 1429 °F. The facility is permitted to burn both solid and liquid hazardous waste. Haircolor is one of the common nonhazardous wastes they incinerate. (#7 – November 2016 – Clean Harbors Deer Park)

Question 8. How Does the Manufacturing Industry Manage the Safety of Contractors?

Answer: Manufacturing plants may utilize contract labor to operate or maintain the facility or do a particular aspect of a job because they have a specialized knowledge or skill or for short periods when there is a need for increased staff quickly such as in turnaround operations.

Therefore it becomes important to ensure that the contractors performing these jobs work safely and do not endanger themselves, other workers at the facility, the process or the environment. When selecting a contractor, the employer evaluates information regarding the contractor's safety performance and programs, ensures that the contract employees understand the hazards of the process and the emergency action plan, and have safe work practices in place to ensure they will perform their duties safely. The contract company is responsible to ensure that their employees are trained in the work practices necessary to perform their jobs. A lot of the companies in this area require contractors to go through the Houston Area Safety Council Basic Plus training which covers a lot of the OSHA mandated contractor training as well as Site specific training. (#8– January 2017 – Hexion)

Question 9. What are OSHA's Standard Interpretation Letters?

Answer: OSHA frequently publishes interpretations and guidance documents related to its standards. These interpretations and guidance documents are known as advisory documents. The purpose of these advisory documents is to advise employers and employees on a variety of issues related to health and safety in the workplace.

One resource businesses have to determine compliance with interpretation of OSHA regulations is OSHA's collection of standard interpretation letters, which are official responses to written questions about compliance with the agency's requirements.

There are several ways to search the OSHA web site for standard interpretation letters, including by date, standard number, and key word. For example, if you want to review OSHA's standard interpretation letters on the training requirements under OSHA's hazard communication standard, you could type key words into the search field. You could also search by the standard number if you know it.

Writing a letter isn't the only way to get information from OSHA. You can also contact OSHA by calling the toll-free number at [1-800-321-OSHA](tel:1-800-321-OSHA) (6742), submitting an e-mail question through the [electronic mail form](#) on OSHA's Web site, or calling your local [OSHA Area Office](#).

However, if OSHA has not issued a standard interpretation letter that addresses your question, the only way to get an official OSHA response is the old-fashioned way – by writing a letter and mailing it to OSHA. OSHA posts selected responses that it thinks will be helpful to others on its standard interpretations web page.

The next time you visit OSHA's Web site, take a moment to review the collection of standard interpretation letters. They can be a valuable resource for businesses seeking guidance on OSHA requirements. If you don't find the answer to your question, you can write your own letter to OSHA.

It's important to note that OSHA requirements are set by statute, standards, and regulations. OSHA's interpretation letters explain these requirements and how they apply to particular circumstances, but they don't create additional employer obligations. Advisory documents do not have the force and effect of the law. Therefore, OSHA cannot issue

citations to employers based on violations of advisory documents. Source: nsc.org, osha.gov. (#9– February 2017 – Delta Companies Group)

Question 10. How Important is the Chemical Industry to the Texas Economy?

Answer: According to the Texas Chemical Council, Texas is the largest chemical producing state in the United States. The Texas chemical industry is the second largest manufacturing industry in the state and is responsible for \$166 billion in annual output. The industry employs 77,560 Texans directly and another 435,150 Texans in related jobs for a total of 512,710 state jobs. The total payroll for employees working in the Texas chemical industry is \$8.1 billion, and Texas chemical wages average \$104,800 per year – that’s 47% higher than the average manufacturing wage. Texas chemical manufacturers contribute \$750 million in state and local taxes and \$3.3 billion in federal taxes. They also invest \$5.5 billion per year to build and upgrade manufacturing facilities throughout the state. The chemical manufacturing industry is clearly a very important contributor to the Texas economy. Source: Texas Chemical Council website (www.txchemcouncil.org) (#10– March 2017 – GEO Specialty Chemicals)

Question 11. What is the difference between standards and regulations?

Answer: A standard is a document approved through consensus by a recognized (standardization) body, that provides, for repeated and common use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is **not mandatory**. It may also include or deal exclusively with terminology, symbols, and packaging, marking or labeling requirements as they apply to a product, process or production method. A regulation is a Government document that lays down product characteristics or their related processes and production methods, including the applicable administrative provisions, with which **compliance is mandatory**. It may also include or deal exclusively with terminology, symbols, and packaging, marking or labeling requirements as they apply to a product, process or production method. No consensus is necessary for establishment of the regulation. In short, the difference between a standard and a regulation lies in compliance. While conformity with standards is voluntary, regulations are by nature mandatory. (#11– April 2017 – Intercontinental Terminals Company)

Question 12. How do you prevent heat-related illness during the summer months?

Answer: Heat stress is the first indication of heat-related illness. If steps are not taken to regulate body temperature, it may advance to heat exhaustion and then to heat stroke.

- Heat Stress -- Exposures to temperatures above 90 degree F, sun exposure, high humidity where the body can no longer regulate its temperature.
- Heat Exhaustion -- Continued exposures to heat where the body has depleted fluids and results in fatigue, sweating, nausea, slightly elevated body temperatures, pale and clammy skin.
- Heat Stroke -- A severe condition where the body can no longer regulate its core temperature resulting from prolonged exposure to excessive heat and characterized by cessation of sweating, severe headache, high fever, hot dry skin, and in serious cases collapse and coma.

Plants rely on both worker knowledge and supervisory oversight to keep workers cool and hydrated in the heat. For example, annual training gives workers information about how to recognize and prevent heat-related illness. Such information also may be displayed throughout the plant. Breaks may be mandated at certain intervals. Water is available throughout the plant. The individual is the best judge of how they are feeling, and employees are encouraged not to take chances. (#12– May 2017 – The Lubrizol Corporation)

Question 13. What is the Chlorine Institute?

Answer: The Chlorine Institute (CI) is a technical trade association of companies involved in the safe production, distribution and use of chlorine, sodium and potassium hydroxides and sodium hypochlorite, the distribution and use of hydrogen chloride and the distribution of vinyl chloride monomer.

The Chlorine Institute accomplishes its mission by: Improving the safety, human health and environmental protection performance of chlor-alkali producers, packagers, distributors, and users; fostering the development of regulations that support the achievement of continuous improvement and voluntary mechanisms that preclude the need for new government regulations; and positioning the Institute as an authoritative and credible source of technical and safety related information and emergency response procedures to prevent and mitigate the release of chlorine and other mission chemicals. Source: Chlorine Institute website

(<https://www.chlorineinstitute.org>) (#13 – September 2017 – OXY Vinyls)

Question 14. What is Responsible Care®?

Answer: Since 1988, Responsible Care has been the chemical industry's commitment to sustainability, the betterment of society, the environment, and the economy. Responsible Care® is a condition of membership for ACC (American Chemistry Council), members all of which have made CEO-level commitments to uphold the program's Guiding Principles. Through these principles, members pledge to improve environmental, health, safety and security (EHS&S)

performance for facilities, processes and products throughout the entire operating system. Some examples of guiding principles include:

- To lead in ethical ways that increasingly benefit society, the economy and the environment.
- To design and operate facilities in a safe, secure and environmentally sound manner.
- To communicate product, service and process risks to stakeholders and listen to and consider their perspectives.
- To make continual progress toward a goal of no accidents, injuries or harm to human health and the environment from products and operations and openly report health, safety, environmental and security performance.
- To promote Responsible Care by encouraging and assisting other companies to adhere to these Guiding Principles

For more information: <https://responsiblecare.americanchemistry.com/default.aspx>

(#14– October 2017 – The Dow Chemical Company)

Question 15. What do you do for Shelter in Place?

Answer:

- Go inside immediately
- Turn off the A/C or heater
- Close all windows/doors
- With duct or masking tape, seal up the door & window frames
- Stay off the phone
- Tune a radio to 88.7FM or 740AM for updates
- Outside alarm horns will sound for ALL CLEAR

For more information: www.deerparklepc.org

(#15– November 2017 – Evonik)

Question 16. What challenges does freezing weather pose to a plant, how do you prevent problems, and how did you fare this winter?

Answer: All plants were asked to weigh in. Jerry Precise from Valvoline said freezing weather can have a domino effect on operations. Plant operators must take into consideration not only what happens at their site, but what happens to everyone else, for example, transportation by truck and rail. When no one can get in or out, you realize how connected everyone is across the country. Jeff Garry from Dow said freezing weather not only causes problems with instrumentation, but can also increase hazards like slips and falls. They thought their La Porte plant got through the freeze unscathed, but ended up having to shut down due to the lack of availability of raw materials. Like during Harvey, they also have to consider what to do about personnel when they cannot safely travel to or from work. Dow brought in an evening shift and

prepared for those staff members to stay late. He recommends being proactive, whether at home or at work, when preparing for freezes. Amanda Accardo from Shell said their employees do a lot of preparation in advance of freezing weather. They have hundreds of miles of potable water lines across their facility, which must be checked for proper insulation. Many access points (eye wash stations, showers, etc.) are opened slightly (bleeders) to let the water flow, but that can pose additional hazards like ice that can cause slips and falls, and icicles that could fall. Shell has detailed checklists to go through before freezing weather, and Accardo said they perform regular preventative maintenance to stay prepared. They will enact a second phase when freezing temperatures are occurring. They still experienced some instrumentation issues, which are handled by stabilizing if you can, and shutting down if you cannot. Elevated sites are particularly susceptible to freezing temperatures, especially when the wind is blowing, so they will build some wind breaks to try to shield them from the weather. Shell Deer Park held a detailed debriefing after the event to look over their checklists and make changes as needed. Accardo said this was the coldest weather they've seen in 22 years, but they fared well overall. Blaine Murphy with GEO Specialty Chemicals added that there are many hazards to consider within the community itself. Murphy stressed the importance of sheltering in place at home if you can, being prepared with supplies so that you do not pose a threat to yourself and others, including first responders, on icy roads.

(#16– January 2018)

Question 17. How does a hazardous waste facility know what a consumer sends them for disposal at their facility?

Answer: Shipping and receiving hazardous waste is a highly-regulated process. Both the shipping generator and the receiving facility have numerous responsibilities. Shipping generator responsibilities: The shipping generator is required to adequately characterize their waste. This includes chemical constituents, waste properties, as well as any special safe handling information. It is up to the shipping generator to properly classify their waste, including any EPA waste codes and DOT shipping descriptions. The generator must certify that they have sufficient process knowledge of analytical results to classify their waste. Permitted Treatment Storage and Disposal Facility (TSDF) responsibilities: TSDFs are required to check incoming waste to be sure it meets their permit and can be safely managed. The individual requirements for any TSDF is found in the Waste Analysis Plan which is part of the facility's permit from TCEQ. These requirements are tailored to the type of facility. *(#17 – March 2018, Texas Molecular)*

Question 18. How do local chemical plants safeguard their critical processes and hazardous materials?

Answer: Most, if not all, plants have critical processes identified and multiple safeguards in place, such as: Crews that ride out storms, backup systems and generators, and shut down procedures. Risk assessments are also an important part of a plant's overall EHSS programs. These can be an exhaustive process, but help identify all possible scenarios and solutions. *(#18 – March 2018, Valvoline)*

Question 19. What is Process Safety Management (PSM)?

Answer: Process Safety Management standards target highly hazardous chemicals (Hydrogen Sulfide, Phosgene, Nitric Acid, etc.) that have the potential to cause catastrophic incidents. These standards aid employers in their efforts to prevent or mitigate episodic chemical releases that could lead to a catastrophe in the workplace and possibly the surrounding community. The OSHA PSM rules were issued in 1992 as a result of significant process industry incidents. Facilities that process or store highly hazardous chemicals in an amount exceeding the recordable quantity must document and implement the 14 key elements of the PSM program:

- Employee Participation Plan
- Process Safety Information
- Process Hazard Analysis
- Operating Procedures
- Operator Training
- Contractor Training
- Pre-Start Up Safety Reviews
- Mechanical Integrity Program
- Hot Work Permitting Process
- Management of Change Process
- Incident Investigations
- Emergency Planning and Response
- PSM Compliance Audits
- Trade Secret
-

(#19 – April 2018, Vopak)

Question 20. What is a turnaround?

Answer: For any refinery or chemical manufacturing facility to be successful, it must have reliable equipment. Just like your own car, our processing units must be well maintained to run well. At the heart of delivering the needed reliability is a maintenance strategy that fixes broken equipment and provides for preventative care. Turnarounds (or Shutdowns) are an integral part of any long term proactive maintenance strategy. Here are some key aspects of Turnarounds:

- For any one process unit or block of units, a Turnaround may be scheduled every 4 – 7 years. For a site like Shell Deer Park, we have many TAs every year.
- During these TAs, critical maintenance is performed and capital projects that provide improvement, regulatory compliance, and growth are implemented on equipment that cannot be taken out of service while the units are in operation. Turnarounds can be single unit outages or multi-unit outages, depending on the strategy at that location.
- Turnarounds typically have 30-50 day durations and the work is performed around-the-clock, 24 x 7. This is normally accomplished in 2 - 12 hour shifts.
- Resource demand for these activities range widely, depending on the scope of the outage; it is typical for outage resources to range from 200 contractors a day to over 6000 depending on scope and duration of the event. Resources needed for a Turnaround can

range from specialty crafts, mechanical labor, delivery services, financial support, and logistics support.

- It is typical to spend 18 to 24 months planning for Turnarounds. Personal Safety, Process Safety, Quality, and Execution Efficiency Planning are integrated into the overall planning effort to provide assurance for HSSE, cost and schedule expectations.
- For larger manufacturing facilities, it is common to have 1 to 2 Turnarounds per year, with at least one of those being a large event.
- Turnaround activities are visible by the community as high resource demands will increase local traffic, normally there is an increase in local hotel occupancy, and there may be some visible flaring observed. Flaring in general, is a sign that a unit is shutting down, or starting up.
- Success on Turnarounds is defined by the ability to execute the right scope at the right time, integrate key projects for compliance/growth/improvements, are competitive in cost, are competitive in duration, meet the reliability premises over the interval, and most importantly do not harm the environment or the people executing the work.

(#20 – June 2018, Shell)

Question 21. What is a characteristic hazardous waste?

Answer: When determining if a waste is hazardous the first thing to look for is its characteristics. This is a solid waste which exhibits one of the following:

D001- Ignitability or something flammable

D002- Corrosivity or something that can rust or decompose

D003- Reactivity or something explosive

D004-Toxicity or something poisonous.

(#21 – August 2018, Clean Harbors)

Question 22. What does a plant do when a hurricane is predicted?

Answer:

Pre-season preparations

Review, update and communicate the hurricane/extreme weather procedure

Identify needed roles and members of the ride-out crew and after the storm response team

Inventory and restock of bedding, linens, ready to eat meals, water and hurricane supplies

Update site employee's emergency contact information

Site preparations when a storm approaches

Begin securing loose items and buildings

Begin securing the production units and shutting down as appropriate

Send ride-out crew home to secure their families and be ready to return

Consider public evacuation protocols and announcements

Communicate with upstream suppliers and customers as needed

Reduce inventory of materials as appropriate

Secure valuable documents and computers

Stage hurricane supplies

Activate employee and community communications

Site actions during storm

Ride out crew monitors condition of the plant for safety and environmental

Site leadership initiates daily communication ritual

Actions are taken to resolve any plant issues as long as it is safe for ride out crew

Site actions post storm

Damage assessment is conducted and damage repairs initiated

Develop plan and timeline to return the plant to normal operations

Conducts employee accounting and assessment of needs

Establish employee/family support plan

Conduct pre-startup safety reviews

Employees return to work

Return plant to normal operations

Conduct hurricane response critique and upgrade plan

(#22 – September 2018, Hexion)

Question 23. What is PetroChemWorks.com and how is it helpful to the community?

Answer:

Petrochemworks.com is a tool that will align your skills, interests and personality with real life job opportunities in the petrochemical industry. Not only is this helpful with employers looking for qualified candidates but also with helping those in the community find positions that meet their unique set of skills as well. Thanks to the East Harris county Manufacturers Association along with several sponsors in creating this tool for those seeking employment in the petrochemical industry. Additional information can be found on the Petrochemworks.com website.

(#23 – October 2018, Delta Companies Group)

Question 24. What is a chemical?

Answer:

A chemical is any substance consisting of matter. This includes any liquid, solid, or gas. A chemical is any pure substance (an element) or any mixture (a solution, compound, or gas). Chemicals occur naturally and can be made artificially.

Examples of Naturally-Occurring Chemicals

Naturally-occurring chemicals can be solid, liquid, or gas. Naturally occurring solids, liquids, or gases may be made up of individual elements or may contain many elements in the form of molecules.

Gases. Oxygen and nitrogen are naturally occurring gases. Together, they make up most of the air we breathe. Hydrogen is the most common naturally-occurring gas in the universe.

Liquids. Perhaps the most important naturally occurring liquid in the universe is water. Made up of hydrogen and oxygen, water behaves differently from most other liquids: it expands when frozen. This natural chemical behavior has had a profound effect on the geology, geography, and biology of Earth.

Solids. Any solid object found in the natural world is made up of chemicals. Plant fibers, animal bones, rocks, and soil are all made up of chemicals. Some minerals, such as copper or zinc, are made entirely from one element. But granite, for example, is a metamorphic rock made up of multiple elements.

Examples of Artificially Made Chemicals

Human beings probably began combining chemicals before recorded history. About 5,000 years ago, though, we know that people began combining metals (copper and tin) to create a strong, malleable metal called bronze. The invention of bronze was a major event, as it made it possible to form a huge range of new tools, weapons, and armor.

Bronze is an alloy (a combination of multiple metals and other elements), and alloys have become a staple of construction and trade. Over the past few hundred years, many different combinations of elements have resulted in the creation of stainless steel, lightweight aluminum, foils, and other very useful products.

Artificial chemical compounds have transformed both the food and pharmaceutical industry. Combinations of elements have made it possible to preserve and flavor food inexpensively, and chemicals are also used to create a range of textures from crunchy to chewy to smooth. Artificial chemical compounds are a major part of the pharmaceutical industry; by combining active and inactive chemicals in pills, pharmacists can treat many different disorders.

Chemicals in Our Daily Lives

We tend to think of chemicals as being undesirable and unnatural additions to our food and air. In fact, of course, chemicals make up all of our foods as well as the air we breathe.

What Is *Not* a Chemical?

If anything made of matter is made up of chemicals, then only phenomena that aren't made of matter are not chemicals. Energy is not a chemical. So, light, heat, and sound are not chemicals; nor are thoughts, gravity, or magnetism.

Credit: Anne Marie Helmenstine, Ph.D. as posted on www.thoughtco.com
(#24 – November 2018, *GEO Specialty Chemicals*)

Question 25. What does “organic” mean for our industry vs. others?

Answer:

Oil & Gas and Downstream

- Organic Compounds contain elemental Carbon – number 6 element on the Periodic Table of Elements
- 100+ organic compounds produced in the United States in quantities ranging from millions of pounds to billions of pounds per year.
- Result is plastics, synthetic fibers, elastomers, drugs, surface coatings, solvents, detergents, insecticides, herbicides, explosives, oil additives, gasoline additives, and countless specialty chemicals.
- Past technologies had organic chemicals resulting as by-products from the coking of coal, e.g., from coal oil.
- More recently oil and natural gas became the dominant sources of the world's industrial organic chemicals. By 1950 at least half of U.S. industrial "organics" were being made from oil and gas, and by 2000 more than 90 percent of the organic chemical industry was based on petroleum. Spawned the term "petrochemicals".
- Less than 10 percent of the oil and gas we consume each year goes into making organic chemicals and the many billions of pounds of products derived from them. Oil and gas are mainly burned as fuel.

Food Industry

- Simply stated, organic produce and other ingredients are grown without the use of pesticides, synthetic fertilizers, sewage sludge, genetically modified organisms, or ionizing radiation. Animals that produce meat, poultry, eggs, and dairy products do not take antibiotics or growth hormones.
- USDA Organic label does not mean no pesticide use. Pesticides derived from natural sources (like biological pesticides) may be used in producing organic food.
- FDA does not regulate the use of the term “organic” on food labels. The National Organic Program (NOP) is the federal regulatory framework governing organically produced crops and livestock. ... The USDA requirements for products that are labeled with the term "organic" are separate from the laws that FDA enforces.
(#25 – February 2019, Lubrizol)

Question 26. Why do we need chlorine?

Answer:

Many people know that chlorine is used to make bleach and other products for cleaning and disinfecting. But you may not know that from the time we wake up for work to our return trip home, chlorine plays a major role in every part of our daily lives. When we wake up we often step on carpet - chlorine is used in carpet construction. Hair care products such as hair colors use chlorine compounds to help the dye absorb into the hair. Similarly, the vibrant color in our clothing and upholstery is made possible using chlorine compounds. If you take any medication, chlorine likely played a role as it is required for the manufacture of 88% of all major pharmaceuticals. Most of us cannot function without a cup of coffee - chlorine is used to disinfect water and has been called the most significant development in public health in the 20th

century by the Centers for Disease Control. Even when we get in the car - chlorine products are used to produce metal, floor mats, plastic bumpers, and foam seating. These are just a few examples of the products we use daily that are made possible through the use of chlorine. For more information, see <https://www.elementofsurprise.org>.

(#26 – March 2019, Oxy Vinyls)

Question 27. What do the emergency response terms “Incident Commander” and “Unified Command” mean?

Answer:

During communications with the public about the March 2019 ITC fire response and cleanup efforts, there have been references to an Incident Commander and to Unified Command. An Incident Commander is the individual responsible for on-scene incident activities, including developing incident objectives and ordering and releasing resources. The Incident Commander has overall authority and responsibility for conducting incident operations.

Wikipedia says, “The **Incident Command System (ICS)** is a standardized approach to the command, control, and coordination of emergency response, providing a common hierarchy within which responders from multiple agencies can be effective. ICS was initially developed to address problems of inter-agency responses to wildfires in California and Arizona but is now a component of the **National Incident Management System (NIMS)** in the US, where it has evolved into use in All-Hazards situations, ranging from active shootings to HazMat scenes.”

Wikipedia goes on to say that **Unified Command** “is an authority structure in which the role of incident commander is shared by two or more individuals, each already having authority in a different responding agency...A Unified Command may be needed for incidents involving multiple jurisdictions or agencies. If a Unified Command is needed, Incident Commanders representing agencies or jurisdictions that share responsibility for the incident manage the response from a single Incident Command Post...Under a Unified Command, a single, coordinated Incident Action Plan will direct all activities.”

(#27 – April 2019)

Question 28. How do you shelter in place?

Answer:

If a shelter in place is ordered, there is something in the air that could, potentially, pose a risk to your health. You should go inside, close doors and windows, possibly seal window frames with duct tape and place a towel on the floor at the bottom of the door to block any gaps, turn off your AC/heater, and monitor local social media and tv stations. Be sure you are signed up for Code RED to receive notifications from the city. <http://www.deerparktx.gov/338/Emergency-Notifications>

(#28 – June 2019, Evonik)

Question 29. How do I sign up for Code Red?

Answer:

- **What is CodeRed?**

It is a communication system used by the City Of Deer Park to communicate critical and timely information on weather, evacuation, shelter in place, missing children, and other community announcements.

It provides a variety of information from one source.

It is used with, but does not replace the City of Deer Park warning alarm system.

- **How does it Work?**

The alerts can be tailored to your communication preferences. You can receive messages by home or cell phone, by text, by email, or all of them.

All communication preferences can be established in one registration

You must opt-in. It is private; you only receive community notifications.

- **How can you register?**

Go to City of Deer Park or LEPC websites or go to www.readydp.com.

Programs are being developed to assist seniors and others without internet access register including a postcard program.

Registration can take 5 minutes or less.

(#29 – August 2019, TMDP)

Question 30. What steps do you take to prevent a spill?

Answer:

We have many programs in place to prevent spills. Listed below are some of the preventive measures:

- We do a visual inspection on every tank each month to ensure the vessel is not showing any signs of leaking.
- We measure the thickness of the walls of the tank at the required intervals.
- All of our tanks have a redundant high level system. If the high level system is tripped, all of the pumps in the plant are automatically turned off.
- All tanks are located inside a dike wall. The containment area is designed to hold the contents of the largest tank plus a freeboard of a 25 year, 24 hour rain event.
- Our truck bay has a containment area of 10,500 gallons. If a trailer did rupture, the concrete is sloped so all of the product would flow into the containment pit.
- If a trailer ruptured in the parking lot our storm water drains contain valves that we can close to prevent oil from entering the storm water drainage system.

(#30 – September 2019, Valvoline)

Question 31. What is sustainability?

Answer:

We treat the world as if we intend to stay.

People, Planet and Profit: Not only economical decision making, but also take into account social and environmental aspects. Sustainability themes within Vopak:

- Excellent People – Have the best people and create an inclusive, agile and solution driven culture.
- Health and Safety – Provide a healthy and safe workplace for our employees and contractors.
- Environmental Care – Be energy and water efficient and reduce emissions and waste.
- Responsible Partner – Be a responsible partner for our stakeholders.

(#31 – October 2019, Vopak)

Question 32. How is metal thickness measured to assure plant equipment stays fit for service?

Answer:

We can't see inside equipment when it's in service. So how do we check metal thickness to ensure the plant stays healthy? There are a number of different methods, including radiography (X-rays), but the most common is Ultrasonic Thickness Testing (UT).

Why do we do UT thickness gauging? To assure the integrity of pressure retaining equipment; Measuring the thickness of metal at a single point in time lets us know the equipment is fit for service; Measuring how the thickness changes over time lets us predict corrosion or erosion rates; and measuring how the thickness changes over time also allows us to spot unexpected or accelerated metal loss.

What do we measure? Piping, vessels, heat exchangers, tanks, or just about any metal object with a relatively smooth surface.

How does a UT thickness gauge work? A probe is placed on metal with a couplant liquid between the probe and metal. Very similar to how an ultrasonic image is taken at a doctor's office. The device measures the flight time of a sound pulse. It converts the time to thickness because sound velocity is known. Sound velocity is determined during calibration and stored in the gauge. That's how we assure the instrument stays accurate.

(#32 – December 2019, Shell Deer Park)