WELCOME – STEP 1

1. Welcome to the September Safety Toolkit –Chemical Hazards. You play an important role in the health and safety across the company, and we thank you for your contribution! Without your focus and dedication to making safety a priority, our people would suffer, our clients would suffer, and our families would suffer. We hope you find the safety tools provided in this Toolkit and in Toolkits like this in the coming months as just some of the many resources afforded to you to communicate Chemical Hazards. As always, the work you do matters, and we are so grateful to have you on the team!

HOW TO USE THIS SAFETY TOOLKIT

1. Supervisor/Lead Script – Start Here! Way to go! Now keep reading and you'll be all set. This script sets you up for success.
2. Supervisor/Lead PowerPoint – Use this as a training moment for your team. Everything you need to know and communicate for each slide is contained in this script! Skip ahead if you are ready to give this training to your team. It's always a good time to learn about Chemical Hazards. The presentation should last about 1 hour depending on group participation.
3. Teaching Tool – We have included a Chemical Hazards Quiz and Answer Key to test your knowledge.
4. Site Communication Poster – A PDF version of the monthly infographic if you would like to display it at your workplace.
5. Sign-In Sheets – Please complete this form when completing Chemical Hazards training and turn-in to the appropriate point of contact as a record of training.
6. What's next? – Use this QR code for yourself AND share it amongst everyone on your team for additional safety resources based on the theme of Chemical Hazards. Look for Interactive resources, recommendations for phone apps, checklists, handouts, and more. Check it out!

SUPERVISOR/LEAD POWERPOINT SCRIPT – STEP 2

NOTES ON THESE SLIDES:

- KLP: Key Learning Point (objective of the slide)
- F: Facilitator

Slide 1: Title Page (30 Seconds)

KLP: You set the tone. If you believe safety is important, the audience will believe safety is important.

The facilitator opens the session by welcoming everybody to the training and noting the monthly focus – Chemical Hazards.

F: Today's task is to attend training on Chemical Hazards. Cell phones should be turned off or silenced during this training. If you need to take a call, please go to (designated area), take the call, and return as soon as possible. {Address any other important announcements or business now.}

Slide 2: Housekeeping (1 Minutes)

KLP: Opportunity for a HSE (Health Safety and Environmental) Moment

F: Prior to training, determine if any fire drills are planned and the response expected from the facility and muster points if alarms should go off. It is important to remind employees that should they need to leave the location at any time, they should inform the Facilitator because, in the event of a fire incident, we need to know their whereabouts. This is an opportunity right at the start of the day to brief the employees on HSE procedures in general for the running of the training course. [If your job site is outdoors, do not overlook this safety moment. Adjust the plan in the event of a job site fire.]

F: Hello Team, I have verified with the HSE department and have confirmed that there are no Fire Drills or Emergency Drills scheduled for today. If we hear an alarm, we will follow site protocol for emergency response.

F: {Point out the fire exits and muster point}

F: Once we are at the muster points, we will do a role call to account for all attendees.

Slide 3: Presenter (2 Minutes) & Introductions (5 Minutes)

F: {This is your moment! This is a chance to visibly "Walk the Talk"}

Share:

- Your personal experience of safety and impact on the company
- Importance of making the most of this opportunity to think about the importance of HSE and discuss with employees
- Appreciate that you are a leader and that you make an impact
- Importance of taking personal responsibility to make a positive impact
- You get out of this training what you put into it
- HSE matters to our company
- The safety program is going to help people feel empowered and take the initiative to improve their own HSE performance through proactive attitudes and behaviors.

You may wish to share:

- A story of your experience in the safety program and how it has changed the way in which you behave.
- Some lessons learned from an incident when you have been involved in the investigation, highlighting the devastating impact that accidents have on people's lives, or you can describe your experience of being involved in an environmental incident. How did this affect the company, and more importantly, affect the lives of others not working for the company?

F: Go around the room and ask everyone to give their name and what their position is. {Wait for their responses, smile, and nod as they participate. Be careful about timing here---if you ask an additional intro question of the participants and give a long-winded answer yourself, your participants will follow with long stories/explanations, and you can accidentally take up a lot of time.}

Slide 4: Why am I here? (1 Minute)

F: Each one of us is the last line of defense to protect workers from injury or the environment from damage, should management systems and collective protections fail. Supervisors and workers are the KEY to HSE. We can promote or destroy the HSE climate through our own behavior and how other workers perceive it.

F: Supervisors and workers are responsible for enforcing safety rules. Regardless of our position, employment status, or background, everyone is responsible for HSE, and everyone can be a HSE leader by demonstrating positive attitudes and behavior.

Slide 5: Chemical Hazards and Toxic Substances (1 Minute)

F: Chemical hazards and toxic substances pose a wide range of health hazards (such as irritation, sensitization, and carcinogenicity) and physical hazards (such as flammability, corrosion, and explosibility).

F: American workers use tens of thousands of chemicals every day. While many of these chemicals are suspected of being harmful, only a small number are regulated in the workplace. As a result, workers suffer more than 190,000 illnesses and 50,000 deaths annually related to chemical exposures[1]. Workplace chemical exposures have been linked to cancers, and other lung, kidney, skin, heart, stomach, brain, nerve, and reproductive diseases.

[1] This number is derived using the methodology from "Green Chemistry in California: A Framework for Leadership in Chemicals Policy and Innovation," (https://pubmed.ncbi.nlm.nih.gov/17317635/) to estimate illness and deaths attributable to workplace chemical exposures.

Slide 6: Types of Chemicals (2 Minutes)

F: There are often several different types of chemicals being used in a workplace at any given time. Each type of chemical can react differently when exposed to the air, the human body, or other chemicals.

F: Flammable materials will burn or ignite, causing fire or combustion. An ignitable chemical has a flashpoint less than 100° F. Several solvents, adhesives, and fuels are flammable materials. Some examples include Methanol, acetonitrile, diesel fuel, and mineral spirits.

F: Combustible materials will burn, but require a flame or elevated temperature plus a spark to start them; and has a flashpoint greater than 100° F but less than 200° F.

F: Corrosive chemicals can cause visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. Agents with a pH of less than 2.0 or greater than 12.5 are considered to be corrosive. We use corrosive chemicals as cleaning agents, degreasers, and chemical reactants. Some examples of corrosive materials are Acetic acid, sodium hydroxide, ammonia, and phenol.

F: Reactive materials react violently or explode under either ambient conditions or when in contact with air, water, or other chemicals.

F: Oxidizers are materials that react strongly with organic materials, sometimes strongly enough to start fires. Oxidizers are often used in disinfectants, cleaning agents, and chlorine. Some other examples are nitric acid and hydrogen peroxide.

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Slide 7: Types of Chemicals, cont. (1 Minutes)

F: Organic peroxides form friction and shock-sensitive explosives. Organic peroxides are often used in bleaching agents and disinfectants.

F: Water reactive chemicals do just as the name suggests; they react violently with water. Water reactive chemicals are found in additives and neutralizers.

F: Air Reactive, or pyrophoric, chemicals react violently with air. These can be found in adhesives and coating agents.

F: Sensitizers are substances that cause hypersensitivity or reactivity to an antigen, such as pollen, especially by a second or repeated exposure.

F: Teratogens are agents that cause malformation of an embryo or fetus. Mercury is a common example of a teratogen.

Slide 8: Routes of Exposure (4 Minutes)

F: There are 4 main ways a chemical can enter the body:

F: Inhalation: For most chemicals in the form of vapors, gases, mists, or particulates, inhalation is the major route of entry. Once inhaled, chemicals are either exhaled or deposited in the respiratory tract. If deposited, damage can occur through direct contact with tissue, or the chemical may diffuse into the blood through the lung-blood interface.
Upon contact with tissue in the upper respiratory tract or lungs, chemicals may cause health effects ranging from simple irritation to severe tissue destruction. Substances absorbed into the blood are circulated and distributed to organs that have an affinity for that particular chemical. Health effects can then occur in the organs, which are sensitive to the toxicant.

F: Skin (or eye) absorption: Skin (dermal) contact can cause effects that are relatively mild such as redness or irritation (dermatitis); more severe effects include destruction of skin tissue or other debilitating conditions. Many chemicals can also cross the skin barrier and be absorbed into the blood system. Once absorbed, they may produce systemic damage to internal organs. The eyes are particularly sensitive to chemicals. Even a short exposure can cause severe effects to the eyes, or the substance can be absorbed through the eyes and be transported to other parts of the body causing harmful effects.

F: Ingestion: Chemicals that inadvertently get into the mouth and are swallowed do not generally harm the gastrointestinal tract itself unless they are irritating or corrosive. Chemicals that are insoluble in the fluids of the gastrointestinal tract (stomach, small, and large intestines)

are generally excreted. Others that are soluble are absorbed through the lining of the gastrointestinal tract. They are then transported by blood to internal organs where they can cause damage.

F: Injection: Substances may enter the body if the skin is penetrated or punctured by contaminated objects. Effects can then occur as the substance is circulated in the blood and deposited in the target organs.

Slide 9: Symptoms of Chemical Exposure (3 Minutes)

F: Once exposed to a chemical, the symptoms of exposure can onset in several different ways. The symptoms could be neurological, respiratory, cardiovascular, or immunologic.

F: Neurologic symptoms can include:

- muscle weakness,
- partial or complete loss of sensation,
- partial or complete paralysis,
- seizures,
- loss of cognitive abilities,
- unexplained pain
- decreased alertness

F: Respiratory symptoms can include:

- sore throat
- coughing/wheezing
- shortness of breath
- decreased lung capacity/decreased lung function
- suffocation/asphyxiation
- lung cancer

F: Cardiovascular symptoms can include:

- heart failure
- inability of blood to carry oxygen throughout the body

F: Immunologic symptoms can include:

- allergy
- immune system slow down or failure
- autoimmune disorders (body attacks itself)

Slide 10: Severity of Health Defects (2 Minutes)

F: The severity of the health effects usually depends on a few factors such as the duration of the exposure, the frequency of the exposure, the route of exposure the chemical enters through be body from, the personal health of the individual exposed, and the type of chemical exposed to.

F: The health effects that arise from exposure can be broken down into two categories; acute and chronic health effects.

F: Acute (short-term) effects show up immediately or soon after exposure to the chemical. They may be minor, like nose or throat irritation, or they could be serious, like eye damage or passing out from chemical vapors. What all these effects have in common is that they happen right away.

F: A chronic health effect is an adverse health effect resulting from long-term exposure to a substance. Symptoms do not usually subside when the exposure stops. Examples of chronic health effects include asthma and cancer.

Slide 11: Workers' "Right to Know" Law (2 Minutes)

F: The Hazard Communication standard, known as the "right-to-know" standard, requires employers to inform and train workers about hazardous chemicals and substances in the workplace.

F: Employers must:

- Provide workers with effective information and training on hazardous chemicals in their work area. This training must be in a language and vocabulary that workers can understand;
- Keep a current list of hazardous chemicals that are in the workplace;
- Make sure that hazardous chemical containers are properly labeled with the identity of the hazardous chemical and appropriate hazard warnings; and
- Have and make available to workers and their representatives Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) for each substance that provide detailed information about chemical hazards, their effects, how to prevent exposure, and emergency treatment if an exposure occurs.

Slide 12: Globally Harmonized System (GHS) (1:48 Minutes)

VIDEO – 1:48 Min

(Click play to play clip)

Slide 13: Globally Harmonized System (GHS), cont. (3 Minutes)

F: In the past, differences in countries' regulations have resulted in non-standardized information for the same material, leading to mishandling and /or unsafe situations. In 2003, the United Nations (UN) adopted the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) to provide a system for the standard handling of chemicals.

F: The Globally Harmonized System (GHS) is an international approach to hazard communication, providing agreed criteria for classification of chemical hazards, and a standardized approach to label elements and safety data sheets. The GHS was negotiated in a multi-year process by hazard communication experts from many different countries, international organizations, and stakeholder groups. It is based on major existing systems around the world, including OSHA's Hazard Communication Standard and the chemical classification and labeling systems of other US agencies.

F: This GHS provides harmonized classification criteria for health, physical, and environmental hazards of chemicals. It also includes standardized label elements that are assigned to these hazard classes and categories, and provide the appropriate signal words, pictograms, and hazard and precautionary statements to convey the hazards to users.

F: Effective 2012, all chemicals must be labeled using the GHS.

Slide 14: Container Labeling in the Workplace (4 Minutes)

F: Chemical manufacturers and importers must convey the hazard information to downstream employers by means of labels on containers and Safety Data Sheets (SDSs).

F: Chemical manufacturers, importers, and distributors must be sure that containers of hazardous chemicals leaving the workplace are labeled, tagged, or marked with the appropriate information. Consumer products having labels meeting requirements of the Consumer Product Safety Act do not have to have additional labeling under the HazCom Standard.

F: Various other chemical products (for example, pesticides, foods, drugs, cosmetics, beverage alcohols) that are subject to labeling laws administered by other Federal agencies are also exempt from the labeling requirements of the HazCom Standard.

F: The 6 elements of a GHS label are:

1. Signal Word – The signal word indicates hazard level. "Danger" is used for the most severe instances, while "Warning" is less severe.
2. GHS Symbol (Pictogram)- These pictograms are used to identify hazardous products and are commonly grouped by chemical/physical risk, health risk and environmental risk
3. Manufacturer Information- This identifies the manufacturer's company name, address, and telephone number.
4. Precautionary Statements/First Aid- These are phrases that are tied to each hazard statement. They describe general preventative, response, storage, or disposal precautions. These statements are found on the chemical's Safety Data Sheet. Similar to Hazard Statements, Precautionary Statements can be identified by a P-Code (like P100).
5. Hazard Statements- These are phrases that describe the nature of hazardous products and the degree of hazard. Hazard statements are on the chemical's Safety Data Sheet (SDS) and identified by an H-Code (like H100).
6. Product Name or Identifiers- This identifies the product or chemical name. Additional identifiers can be noted to the right of the Manufacturer's information (#1).

Slide 15: Primary vs Secondary Container Labeling (3 Minutes)

F: Employers must ensure that no worker uses, stores, or allows any other person to use or store any hazardous substance in a laboratory if the container (including bags, barrels, bottles, boxes, cans, cylinders, drums, and reaction vessels) does not meet the following labeling requirements in OSHA's Hazard Communication standard:
The identity of the chemical and appropriate hazard warnings must be shown on the label.
The hazard warning must provide users with an immediate understanding of the primary health and/or physical hazard(s) of the hazardous chemical through the use of words, pictures, symbols, or any combination of these elements.
The name and address of the manufacturer, importer or other responsible party must be included on the label.
The hazard label message must be legible, permanently displayed and written in English.

F: OSHA does recognize the difference between a primary and secondary container. Primary containers are generally large storage containers, including drums, tanks, or silos. Primary container labeling is vital for ensuring workplace safety as it's essential that anyone coming into contact with these substances fully understands the risks they pose. Primary or shipped container labels are used on any container leaving the workplace. These labels must have the six required elements of a GHS chemical label.

F: Secondary containers are smaller receptacles, such as bottles, jugs, and jars, that hold a smaller portion of the hazardous material. Secondary container labels are sometimes called workplace labels. These containers must comply with GHS, but there are some exceptions to the rule for containers that stay within the work area and possession of the worker who filled it or for material that is used within the work shift of the individual who filled it. The best practice is to match this label to the primary container label for consistency, if possible.

Slide 16: Safety Data Sheets (3 Minutes)

F: The GHS also standardizes the format for Safety Data Sheets (SDS)s.

F: Chemical manufacturers and importers must develop an SDS for each hazardous chemical they produce or import and must provide the SDS at the time of the initial shipment to a downstream distributor or user. Distributors also must ensure that downstream employers are similarly provided an SDS.

F: Employers who become newly aware of "any significant information" regarding the hazards of a chemical must revise the labels for the chemical within six months of becoming aware of the new information and labels on containers of hazardous chemicals after that time must contain the new information.

F: OSHA does not require that SDSs be provided to purchasers of household consumer products (such as "windex" and "white-out") when the products are used in the workplace in the same manner that a consumer would use them, i.e.; where the duration and frequency of use (and therefore exposure) is not greater than what the typical consumer would experience. Employees who are required to work with hazardous chemicals in a greater duration and frequency of exposure than a normal consumer have a right to know about the properties of those hazardous chemicals.

Slide 17: Safety Data Sheets, cont. (5 Minutes)

F: SDSs are broken down into a standardized, 16 section format. Every SDS in the workplace should follow this standard. Each section holds specific, important information about the chemicals in use.

F: These sections are:
Section 1: Identification – identifies the chemical on the SDS and its recommended uses; provides contact information of the supplier.
Section 2: Hazard(s) Identification – identifies the hazards of the chemical and appropriate warning information,
Section 3: Composition/Information on Ingredients – identifies ingredient(s) contained in product, including impurities and stabilizing additives; includes information on substances, mixtures, and all chemicals where a trade secret is claimed.
Section 4: First-Aid Measures – describes initial care that should be given by untrained responders to an individual who has been exposed to the chemical.
Section 5: Fire-Fighting Measures – provides recommendations for fighting a fire caused by the chemical.
Section 6: Accidental Release Measures – provides recommendations on appropriate response to spills, leaks, or releases, including containment and cleanup to prevent or minimize exposure to people, properties, or the environment.

Section 7: Handling and Storage – provides guidance on safe handling practices and conditions for safe storage of chemicals.
Section 8: Exposure Controls/Personal Protection – indicates exposure limits, engineering controls, and PPE measures that can be used to minimize worker exposure.
Section 9: Physical and Chemical Properties – identifies physical and chemical properties associated with the substance or mixture.
Section 10: Stability and Reactivity – describes reactivity hazards of chemical and chemical stability information; broken into three parts: reactivity, chemical stability, and "other".
Section 11: Toxicological Information – identifies toxicological and health effects information or indicates that such data is not available.
Section 12: Ecological Information – provides information to evaluate the environmental impact of the chemical(s) if it were released into the environment.
Section 13: Disposable Considerations – provides guidance on proper disposal practices, recycling, or reclamation of the chemical(s) or its container, and safe handling practices.
Section 14: Transport Information – provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail, or sea.
Section 15: Regulatory Information – identifies safety, health, and environmental regulations specific for the product that is not indicated anywhere else on SDS.
Section 16: Other Information – indicates when SDS was prepared/revised; may state where changes have been made to previous versions; other useful information.

F: A list of hazardous chemicals known to be present in the workplace should be kept by product identifier from the SDS. They may be listed by product name, common name, or chemical name. It is important that the name used must be the same as the term used on SDS and label for cross-referencing. The list should cover chemicals in all forms - liquids, solids, gases, vapors, fumes, and mists - whether they are "contained" or not. The nature of the chemical and the potential for exposure are the factors that determine whether a chemical is covered.

Slide 18: Chemical Hazard Control Approaches (2 Minutes)

F: While there are several effective approaches to controlling chemical hazards, these approaches can generally be broken down into three primary steps.
F: Firstly, if possible, remove the hazardous chemical from the work area. This will eliminate the hazard potentially all together. Additionally, consider trading hazardous chemicals for non-toxic substitutes.

F: Second is to implement work policies and procedures. Taking steps to train employees on reading labels and know what symbols and warnings mean, use small amounts of chemicals, measuring & diluting them, use tools to avoid direct contact with chemicals, and to cover and store chemicals safely will greatly reduce chemical hazards. Training is not satisfied solely by giving the employee the data sheets to read. An employer's training program is to be a forum

for explaining to employees not only the hazards of the chemicals in their work area, but also how to use the information generated in the hazard communication program.

F: When the hazard cannot be eliminated or completely controlled by policy, the last step is to ensure all employees are wearing the correct personal protective equipment (PPE). Individuals should use gloves, masks, goggles, aprons, hats, shoes, and other protective covers when working with or around hazardous chemicals.

Slide 19: Personal Protective Equipment (PPE) (4 Minutes)

F: The use of proper PPE while working with hazardous chemicals is extremely important. When unsure of the appropriate PPE to be worn while handling a certain chemical, you can reference section 8 of the SDS for the specific chemical. This section will include the recommended PPE to be worn while handling that chemical.
F: Typically, when working with chemical hazards, the PPE recommended should be made of rubber, rubberized fabrics, neoprene, and plastics. When chemical or physical hazards are present, check with the clothing manufacturer to ensure that the material selected will provide protection against the specific hazard.

F: Eye and face protection prevents eye exposure to chemical fumes and splashes. Goggles that protect against liquid or chemical splash entry.

F: Gas masks are also known as "air-purifying respirators" because they filter or clean chemical gases out of the air as you breathe. This respirator includes a facepiece or mask, and a cartridge or canister. Straps secure the facepiece to the head. The cartridge may also have a filter to remove particles. Gas masks are effective only if used with the correct cartridge or filter (these terms are often used interchangeably) for a particular biological or chemical substance. Selecting the proper filter can be a complicated process. There are cartridges available that protect against more than one hazard, but there is no "all-in-one" cartridge that protects against all substances. It is important to know what hazards you will face in order to be certain you are choosing the right filters/cartridges.

F: Chemical-resistant gloves are important for preventing chemical burns or other chemical irritations on the hands and forearms.

Slide 20: Questions (4 Minutes)

F: Any questions?