NIST | OFFICE OF WEIGHTS AND MEASURES

Annex No. 1-Safety Considerations and Glossary of Key Safety Phrases

Annex No. 1

Safety Considerations and Glossary of Key Safety Phrases

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NIST Examination Procedure Outline (EPO) Safety Annex for
Safety Considerations and Glossary of Key Safety Phrases

1. Part I – Safety Considerations.

NOTE: When excerpting an Examination Procedure Outline for duplication, this section of Safety Considerations and "Glossary" should also be duplicated and included with the outline.

The importance of safety in the weights and measures workplace cannot be overemphasized. During the inspection and testing of weighing and measuring equipment, the issue of safety should be foremost in the inspector's or serviceperson's mind. It is only through vigilant site awareness and conscientious adherence to safety regulations and procedures on a regular basis that the inspector or serviceperson can decrease the likelihood of causing serious personal injury, injury to individuals in and around the inspection area, or damage to property and equipment. Safety-consciousness must also extend to the selection and maintenance of testing equipment and other equipment used by an inspector or serviceperson.

Weighing and measuring equipment differ in design, and the safety of their use may be affected by other factors in the workplace such as ignition sources, environmental influences and characteristics of the individual installation. Because of this variability, it is impractical to make specific recommendations that will identify or address all safety hazards that may be present in a particular jurisdiction.

In order to properly address the safety hazards that may be present during an inspection activity, a jurisdiction should consider the following steps in working to minimize the hazards:

1. Conduct a job hazard analysis;
2. Determine what safety and health training is needed;
3. Determine the control (elimination, substitution, engineering, administrative, and personal protective) needed;
4. Provide a written safety and health program;
5. Contact the safety officer at the establishment or business to inquire if its inspector(s) need to be aware of special safety issues and if additional precautions are required (e.g., training personal protective equipment, etc.); and
6. Enforce the policy.

Before proceeding with the inspection and testing of a weighing or measuring device, the inspector or serviceperson should be completely familiar with all safety regulations and policies in effect at the inspection location. Such regulations and policies include local, state, Federal, and the Federal (or state) Occupational Safety and Health Administration (OSHA) regulations and safety policies established by the firm in which the inspection is taking place or established by the inspector's or serviceperson's employer.

The Examination Procedure Outlines (EPOs) address a wide variety of activities involving the inspection and testing of various types of weighing and measuring equipment. Each of these inspection activities require knowledge of safety information specific to the inspection of that device. A brief paragraph at the beginning of each EPO reminds the inspector or serviceperson of some of the basic safety precautions, which should be taken prior to proceeding with the inspection procedure. Also, safety reminders are included at various points throughout the body of the EPO. The safety reminders use "key phrases" to prompt the inspector or serviceperson to remember particular safety precautions. A glossary of these key phrases is included in this document. The glossary provides a brief explanation of the intent of the safety

precaution and, in some cases, provides a listing of a source or sources where additional information might be obtained pertaining to a particular safety concern.

The safety reminders included in this document and associated EPOs are not intended to cover all possible safety precautions that should be taken before proceeding with the inspection of a weighing or measuring device. (Similarly, the safety information and contacts are not a complete listing of all possible sources of information and guidance in the area of safety.) The safety reminders are intended to raise the awareness of the weights and measures inspector or serviceperson, and to serve as a reminder to make safety an integral part of all inspection and testing procedures and related work. The safety reminders are also intended to encourage the inspector or serviceperson to thoroughly investigate the safety requirements in effect at an inspection site and to identify and practice the safety procedures necessary to prevent personal injury, injury to others, or damage to equipment and property during the inspection. Perhaps the most important tool in any safety toolbox or standard practices to detect and address potential hazards is the awareness to *ask questions* about safety matters along with the training necessary to develop this ability to keep safety awareness at the forefront throughout the entire inspection.

For additional information on safety in the weights and measures workplace and the development of a safety program, see the July 1991 Final Report of the 96th NCWM Task Force on Safety (page 71). Upon request, a USB flash drive compilation of NCWM Annual Reports from 1905 to 2021 (including the 1991 report) is available from the NIST Office of Weights and Measures in Adobe Acrobat PDF format.

One final note from the NCWM Safety Awareness Liaison:

> "There cannot be enough emphasis placed on safety awareness. During the course of our daily jobs, we often forget how important safety is until something happens that could have otherwise been avoided with an ounce of prevention.
>
> Please take the time to send safety articles, tips and specific occurrences from your region to the regional safety liaison in your jurisdiction. If these items are shared with other members, then hopefully we can prevent the same thing from happening to you and increase safety awareness."

Safety policies and regulations vary among jurisdictions. It is essential that inspectors or servicepersons be aware of all safety regulations and policies in place at the inspection site and to practice their employer's safety policies. The safety reminders included in the EPOs contain general guidelines useful in alerting inspectors and servicepersons to the importance of taking adequate precautions to avoid personal injury. These guidelines can only be effective in improving safety when coupled with training in hazard recognition and control.

2. Part II – Glossary of Safety Key Phrases.

The following key phrases are used throughout this document and NIST EPOs to serve as reminders to the inspector or serviceperson to practice safety as a routine part of their work.

2.1. Bonding[1].

The safety practice of permanently connecting (bonding) to a ground fault current path the electrically conductive components/equipment in a system likely to become energized so that in this event the ground fault has a pathway of low impedance to allow the activation of the overcurrent protection devices.

[1] Also see National Fire Protection Association (NFPA) 70, National Electrical Code.

NOTE: Proper grounding and bonding practices are intended to work together to create a safe work environment. Together grounding and bonding help limit voltage resulting from lightning, line surges, or unintentional energization of noncurrent carrying parts of site equipment and sources of static ignition. Adhere to practices that do not introduce electrostatic discharge or other static sources that can cause ignition hazards.

2.2. Chemicals, Petroleum Products, and Other Hazardous Materials.

Be familiar with the nature of the products at an inspection site that is located in a plant or other facility which handles, uses, or packages chemicals, petroleum products, or hazardous materials; it is essential that the inspector or serviceperson be familiar with the nature of the product and any protective measures which should be taken prior to working around the product. For example, some products may cause injury through exposure to the skin or through inhalation of the fumes or airborne particulates. Similarly, caustic products may also damage field standard weights or measures or equipment used in the test process.

Determine whether or not protective clothing or equipment is needed prior to working with the product.

Safety Data Sheets (SDSs) can provide much of the basic information about the hazards involved with a product. The manufacturer of the product should be able to provide further information about the product. Several sources of information concerning chemicals, petroleum products, and hazardous materials are listed below. You can also use internet search engines by entering SDS, the manufacturer and product name into the search window.

American Chemical Society
1155 16th Street NW
Washington, DC 20036
800-333-9511 (U.S. & Canada)
(614) 447-3776 (Outside North America)
www.acs.org

American Chemistry Council
700 Second Street NE
Washington, DC 20002
Phone: (202) 249-7000
www.americanchemistry.com

http://www.msds.com (free but registration required)

American Petroleum Institute
200 Massachusetts Avenue NW
Washington, DC 20001
Phone: (202) 682-8000
www.api.org

Look for leakage or spillage of chemicals, petroleum products, or hazardous materials at or near the inspections site. Leakage or spillage of these products can be potentially hazardous if the inspector/serviceperson or facility employee is exposed to the product and is not wearing personal protective equipment. Additionally, any product collecting on the ground surface can result in slippery, unsafe conditions for an individual moving about the inspection area and may also present a fire hazard. If leaking or spilled product results in unsafe conditions at the inspection site, the testing procedure should be discontinued until the unsafe conditions are corrected.

2.3. Clothing.

2.3.1. Synthetic Fabric Clothing. Synthetic clothing should not be worn when working around flammable products. Synthetic clothing melts at high temperatures; if the person wearing the synthetic clothing is exposed to flames, the clothing may melt and stick to the person's skin to result in severe burns.

2.3.2. Combustion Resulting From an Ignition Source. Combustion can result when an ignition source is present and fuel and oxygen are also available. Many types of synthetic clothing also tend to build up a static charge; this can be dangerous as a potential ignition source around flammable products.

2.3.3. Proper Fitting Attire.

Use caution when wearing **loose** fitting clothing (including jewelry, unbound hair, and types of wearable technology) around machinery such as conveyor belts, weight movers, meat hooks, gears, etc. The clothing may become entangled in the machinery and result in personal injury.

2.4. Electrical Hazards.

Be particularly aware of potential electrical hazards in or near the inspection site when testing electronic devices or working in the vicinity of electrical equipment. Loose or exposed wiring and a frayed or worn electrical cord should be brought to the attention of management at the inspection site. Avoid standing on wet surfaces unless the electrical equipment is properly insulated and grounded. Note if there are high voltage sources or open electrical panels near the inspection site and keep equipment away from these sources. For example, look overhead and underfoot for powerlines when working with a crane, weight cart, or forklift.

2.4.1. Combustion Resulting From an Ignition Source. Combustion can result when an ignition source is present and fuel and oxygen are also available. Electrical hazards may also be potential ignition sources when testing devices which dispense flammable products or working near flammable products. Be sure that provers and other test equipment are equipped with explosion-proof motors. Always check the electrical supply lines for testing equipment carefully for signs of wear or damage, and correct any potentially hazardous conditions. Take steps to protect these supply lines from damage during use.

2.5. Emergency Action Plan/Procedures.

Always be familiar with emergency procedures BEFORE beginning an inspection. After an emergency has developed, crucial time can be lost if emergency procedures are not known. Be familiar with the procedures to follow in the event of an equipment malfunction or the development of a dangerous situation with the equipment or in the vicinity of the inspection site when operating specialized testing equipment.

Be familiar with the nature of any product being dispensed by a device or being used in or near the inspection area. Know the emergency procedures to be followed when a spill has occurred, or a person has been exposed to the product. Knowledge of emergency procedures and related information should include the correct selection and use and number of fire extinguishers, the location of emergency shut-offs, and evacuation (or shelter-in-place) procedures.

Keep a list of emergency phone numbers handy at all times in a notebook or on a card. A cell phone programmed with emergency numbers might be located on site in a safe and unobstructed location at all times during the inspection. Examples of numbers to keep are the closest local fire department, emergency medical facility, and other appropriate public safety agencies.

Request or obtain the Emergency Action Plan at the location of the test and/or review the plan with the site safety contact. Identify, or request information about the warnings for that location, such as fire alarm (sound/light/announcement) and emergency exit signs. An Emergency Action Plan is the plan for how to respond in the event of various emergencies. The plan would provide such items as the evacuation route and how to shelter in place (often a diagram on the wall) or signage directing to a safe shelter place or decontamination space and the emergency contact person/phone numbers.

2.6. Eye Protection.

Appropriate eye protection is recommended when working around hazardous products which may inadvertently splash into the eyes, and eye-wash facilities should be considered. Contact lens wearers should be particularly careful to follow the instructions of their eye-care practitioner and local OSHA representative when working around hazardous products.

Appropriate eye protection should also be worn when working in an area with overhead projections such as meat hooks or other sharp objects or where there is a potential of flying projectiles (e.g., when working near tools that grind, chip, etc.). Eye protection may be glasses, goggles, a face shield, or other based on the potential type of hazard(s) as a result of workplace activities and the protective measure should be properly fitted when used with prescriptive eyewear.

2.7. Fire Extinguisher.

Know the proper use and selection and number of fire extinguishers for a given application. Contact your local fire department for current information and training.

2.8. First Aid Kit.

An appropriate first aid kit or kits (differing needs in worksite scenarios) should be provided for every vehicle and in every laboratory. Consideration should be given to the type of work that the inspector, metrologist, or serviceperson typically performs, and the types of hazards typically encountered in these types of activities. Items in addition to those contained in a basic first aid kit may need to be added to address the potential hazards which may be encountered by the person who will be most likely to use the first aid kit. Check with your local OSHA office or with your departmental safety officer for input on the items to be included in each kit.

2.9. Grounding[2].

The safety practice of grounding is used as a means to establish a continuous connection to earth or some conducting body that has the capacity to conduct the electrical equipment's current to a path that prevents the buildup of voltage in the event the power supply to electrical equipment would result in injury to persons or damage to equipment on site.

NOTE: Proper grounding and bonding practices are intended to work together to create a safe work environment. Together grounding and bonding help limit voltage resulting from lightning, line surges, or unintentional energization of noncurrent carrying parts of site equipment and sources of static ignition. Adhere to practices that do not introduce electrostatic discharge or other static sources that can cause ignition hazards.

It is essential to properly ground the prover being used when inspecting meters which dispense flammable products. Be sure to connect the grounding wire or jumper cable to bare metal surfaces, not to painted or plastic surfaces. It may be necessary to ground yourself.

[2] Also see National Fire Protection Association (NFPA) 77 Recommended Practice on Static Electricity.

2.9.1. Retail Motor-Fuel Dispensers.

When testing retail motor fuel dispensers, be sure to:

- Ground the nozzle against the prover neck when dispensing product.
- Ground the neck of the prover against the metal funnel when returning product to the storage tank.
- If a test measure is left on a cart when dispensing product or returning product to the storage tank, be sure the cart is properly grounded.

2.9.2. Vehicle-Mounted Tank, Loading-Rack, or Wholesale Meters.

- Use a grounding wire, jumper cable, or terminal ground to ground the prover to the vehicle from which the product is obtained.
- Use a grounding wire, jumper cable, or terminal ground to ground the prover to the vehicle or tank when returning product to storage.
- These guidelines also apply when testing liquefied petroleum gas liquid-measuring devices. Although these devices are tested as a "closed system", the possibility of leaks is always present and can present a potential hazard.
- Always ground yourself to an above ground storage tank before climbing onto the tank by touching the tank or the handrails.

2.10. Ignition Sources.

2.10.1. Combustion Resulting From Possible Ignition Sources. Combustion can result when an ignition source is present and fuel and oxygen are also available. It is necessary to avoid possible sources of ignition when testing meters which dispense petroleum products or other flammable materials. Possible sources of ignition include, but are not limited to, open flames or smoking, metal to metal contact which causes sparking (e.g., metal wrench or hammer on a pipe fitting), a running motor, static discharge, worn or faulty electrical wiring, improper grounding, and the wearing of synthetic clothing. Also, be sure that provers and other test equipment are equipped with explosion-proof motors and electrical switches. If ignition sources cannot be eliminated at the time of the inspection, the testing procedure should be discontinued until the hazardous conditions are corrected.

Because disposable lighters can spark upon impact, the inspector/serviceperson should avoid carrying a lighter in their front pocket.

Always use a <u>metal</u> funnel to return product to storage tanks. Never use a plastic safety cone as a funnel!!

Pouring product into the return fillpipe can build up static electricity; a proper ground must be made by placing the metal neck of the prover against the metal lip of the funnel.

Other possible workplaces where combustion is possible can occur when fine particulate dust clouds (the fuel) come in contact with a possible ignition source in the presence of oxygen. Dust may present in any location, but in particular at silos (agricultural/grain dust), manufacturing warehouses (metal or product dust), or wood working/lumber shops (wood dust).

2.11. Lifting.

Be familiar with and use proper lifting and carrying techniques when moving and stacking test weights or heavy equipment to prevent personal injury. To reduce the possibility of back injury, use equipment which would decrease the amount of lifting required whenever possible (For example: an extended height funnel, carts for transporting weights, platforms suspended from monorail scales instead of overhead meat hooks, team lifting to lift or carry heavy or awkward objects, etc.).

Periodic training in proper lifting and carrying techniques is encouraged.

2.12. Location.

Carefully examine the inspection site prior to beginning an inspection and testing procedure. Look for potentially dangerous situations such as wet areas which may be slippery (see also **Wet/Slick Conditions**), the use or presence of hazardous and/or flammable materials and any spillage or leakage of these products (see also **Chemicals, Petroleum Products, and Hazardous Materials**), adjacent activities which may contribute a potential hazard to the inspection (e.g., welding near the inspection area would provide a potential ignition source when testing devices which dispense flammable liquids), obstructions in the area which may prove to be safety hazards (e.g., objects on the ground which the inspector might trip over, objects in the path of the inspector to and from the device being tested, exits blocked by test equipment or vehicles, etc. -- see also **Obstructions**), pedestrian or vehicle traffic (see also **Traffic**), steep or narrow stairways, overhead hazards (e.g., feed bins, loading rack equipment, low-hanging beams in feed mills and warehouses, overhead activities, low doorways, etc. -- see also **Overhead Hazards**), lack of or defective handrails, and loose or exposed wiring (see also **Electrical Hazards**). Use great care when moving around and working in areas in which these potential hazards are present. When using flammable products (e.g., testing metering devices), note the location of the fire extinguisher, emergency shut-offs, emergency plan, etc. prior to beginning the inspection.

2.13. Nature of Product.

Be knowledgeable about the nature of the product being dispensed by a device prior to beginning a test on the device. For all hazardous materials, it is recommended that a copy of the Safety Data Sheet (SDS) be obtained for that product and reviewed prior to testing the device. Carefully read and follow the instructions on any warning labels posted on the device or affixed to a packaged product for precautions which should be taken when working around the product. Nonstandard markings, illegible markings, or markings inconsistent with information provided in the SDS or a published documentary standard warrant clarification. Proceed only when new or unfamiliar terms or acronyms, are clearly explained. Safety awareness is key in understanding the nature of products: (1) the device under test (DUT) comes in contact with or is used to weigh or measure; and (2) that might be present in the workplace environment. Although mitigation may be necessary should there be exposure to allergens (e.g., certain grains or grasses, noxious plants) when these substances are either part of the DUT operations or in the workplace environment.

Any potential for exposure to pathogens (airborne or otherwise) should be part of workplace safety awareness discussions. Inspection sites may post safety practices (e.g., foot and tire wash procedures while on and exiting the worksite) to prevent the transmission of pathogens and illness. These operations may also post alerts which may vary in levels as the risks for transmission or numbers impacted rise and fall. Be aware that some workplace activities and environments may place you more at risk for insect/animal stings or bites that may result in illness (allergic reaction, an infection, or spread disease). Preventative measures may need to be implemented at work sites in certain geographic regions that are a more ideal natural habitat, or during peak seasons for insect/animal populations or because of the nature of their operations these worksites attract certain insect/animal populations. The design of some commercial equipment may necessitate installation inground or operation in rural locations that are in proximity to insect/animal nests and dens. Some preventative options to consider

before coming in contact with local wildlife might include wearing protective clothing, topical repellants, or other types of remedies, consulting nature/wildlife advisories, etc.

2.14. Obstructions.

Care should be taken to avoid injury from obstructions in the work area during the course of an inspection. Obstructions which might prove to be safety hazards include objects on the ground which the inspector might trip over, objects in the path of the inspector to and from the device being tested, steep or narrow stairways, holes, uneven walking surfaces, exits blocked by test equipment or vehicles, etc.

2.15. Overhead Hazards.

Note any overhead hazards such as feed bins, loading rack equipment, low-hanging beams in feed mills and warehouses, activities overhead, and low doorways prior to the inspection. Take precautions (such as wearing a hardhat when there are work/equipment/obstructions located above the inspector/serviceperson's head) to avoid potential injuries as the situation dictates.

2.16. Personal Protection Equipment.

Included among the many types of personal protection equipment which is available are items such as non-synthetic clothing, coveralls, gloves, barrier cream, non-permeable safety aprons, safety sleeves, safety shoes, respirators, goggles, face shields, safety glasses, hearing protection, and hardhats and sun/weather protection. OSHA and safety-clothing and safety-equipment manufacturers can provide additional information concerning the selection of personal protection equipment for a given type of inspection activity.

Before providing personal protection equipment (PPE), management should determine whether or not PPE is actually required for a particular inspection activity. If it is determined that an employee is exposed to a hazard, the management should first try to minimize the hazard by examining and modifying work methods and conditions. If it is determined that the employee is still exposed to the hazard after modifying work methods and conditions, consideration should be given to purchasing PPE. It should be realized that certain types of PPE such as respirators can require employee physicals and extensive ongoing training and maintenance; failure to follow these requirements may render the PPE ineffective or even dangerous.

2.17. Preventing Cross Contamination.

NIST HB 133 Chapter 1. General Information Section 1.6. Health and Safety[3] provides general guidance on health and safety practices in the handling and protection of individuals and products encountered during an inspection. The range of chemical products and biological matter encountered as well as hygienic practices (for personnel and equipment) in the workplace environment should be given consideration to ensure that the inspector or serviceperson nor their equipment become the source of health and safety issues such as cross contamination of hazardous substances (e.g., bacteria, allergens, chemical substances) especially in food handling operations.

2.18. Safety Cones/Warning Signs/Other Types of Barriers.

Safety warning signs or safety cones should be positioned to block off the work area when the inspection site is exposed to vehicular or pedestrian traffic. These precautions should also be taken when working around flammable liquids to warn people of a potential hazard; in this instance, it is also recommended that "No Smoking," "No Open Flame," and "No Spark" signs be posted. A variety of other barrier designs are to be considered that will maximize visibility to these hazard warnings (visible

[3] See NIST Handbook (HB) 133 Checking the Net Contents of Packaged Goods available on the NIST OWM website at: **https://www.nist.gov/pml/owm/nist-handbooks**.

to all classes of vehicular traffic at the firm) and are appropriately sized or are expandable to barricade the entire access path that vehicular and pedestrian traffic have to the inspection site.

2.19. Safety Data Sheet (SDS).

SDSs are provided by the manufacturer of a product to identify the product's basic characteristics and hazardous information. The Hazard Communication Standard (HCS) (29 CFR 1910.1200(g)), revised in 2012, requires that the chemical manufacturer, distributor, or importer provide Safety Data Sheets (SDSs) (formerly MSDSs or Material Safety Data Sheets) for each hazardous chemical to communicate information on these hazards. The SDS required format for consistency includes 16 sections that provide the following information in Section: 1 specifies the chemical; 2 identifies the hazard(s); 3 chemical composition; 4 first aid measures; 5 fire-fighting measures; 6 accidental release measures; 7 handling and storage; 8 exposure limits, engineering controls and personal protective measures; 9 physical and chemical properties of the substance; 10 stability of the chemical and reactivity hazards; 11 toxicological and health effects information; 12 environmental impact of the chemical; 13 proper disposal practices; 14 guidance on shipping/transporting; 15 product's specific safety, health, and environmental regulations; and 16 SDS preparation/revision details and other useful information. SDSs can be obtained from the manufacturer of the product. As new information is discovered concerning the properties of a product and the effects of various levels of exposure to the substance, SDSs can change. It is recommended that updated versions of the SDSs be obtained on at least an annual basis. For further information on SDSs, contact your local OSHA office.

2.20. Safety Shoes.

Safety shoes are recommended to be worn when performing certain weights and measures activities to prevent personal injury. Safety shoes are available to prevent possible injury to the foot from falling weights or equipment and also to provide protection from slippage and static discharge. Many styles and types of safety shoes are available. The American National Standards Institute (ANSI) and safety-shoe manufacturers can provide additional information concerning the selection of safety shoes for different types of inspection activities and environments.

2.21. Security.

When conducting a job safety analysis, or before beginning the inspection, ask what security related information the inspector needs to know about the inspection and inspection site. For inspection sites with complex security protocols or multiple hazard communication methods or a large facility, then the jurisdiction may wish to consider that a site provided escort is a preferred practice as it gives the inspector the resource of immediate communication and guidance in the event of an emergency.

2.22. Static Discharge.

2.22.1. Combustion Resulting From a Potential Ignition Source. Combustion can result when an ignition source is present and fuel and oxygen are also available. Sources of static discharge introduce the potential of an ignition source into the testing area. Avoid all sources of static discharge when testing flammable products. Also see NFPA 77 Recommended Practice on Static Electricity.

2.23. Support.

2.23.1. Scales. Be certain that the installation is adequate to support the scale, test weights equal to the capacity of the scale, and any weight carts, test platforms, platters, chains, hooks, or other accessories used to suspend or support the test weights prior to proceeding with a testing procedure. Any test platforms, platters, chains, hooks, or other accessories must be capable of supporting the

test weights necessary for the inspection. Lifting and rigging equipment used with cranes or hoists should be rated (and marked) and comply with appropriate standards (such as American Society of Mechanical Engineers (ASME) B30 Series Safety Standards that cover various types of lifting machinery and 20 CFR 1910.179 – OSHA Overhead and Gantry Cranes) including operation by a qualified operator.

2.23.2. Meters. Be sure the inspection site surface is rigid enough to support the weight of a large volume prover when the prover is filled with the test liquid. Chocks should be used to secure the wheels of the prover during the testing procedure.

2.24. Switch Loading.

Do not use a test measure that has been used for drafts of gasoline to measure diesel fuel until you are certain that all gasoline vapors have dissipated. This practice, called "switch-loading" is extremely hazardous because diesel fuel is likely to produce a static charge while being dispensed into a test measure or return tank that was previously used to hold gasoline. Sparks from this charge could easily ignite gasoline vapors inside the test measure or a return tank, such as found in a vehicle mounted tank application. Additional safety measures to be utilized are proper grounding procedures and the use of static discharge lines.

2.25. Traffic.

Be aware of vehicular and pedestrian traffic patterns in and around the inspection site. Mark the test area appropriately by using safety cones, flags, etc.

2.26. Transportation of Equipment.

Consideration must be given to isolating the inspector/serviceperson from weighing and measuring equipment during the transportation of the equipment to and from the work site. The inspector/serviceperson must be isolated from hazardous fumes; means of such isolation include, but are not limited to, vehicles outfitted with protective barriers; equipment carriers located outside of the vehicle; vehicles with separate driver/equipment compartments, etc.

All equipment must be properly secured to avoid exposing the inspector/serviceperson to the potential of flying projectiles.

2.27. Weather.

In the event a potentially hazardous weather event (see examples below) is approaching or moves into the area during testing, testing should be halted and steps taken to mitigate the effects of weather or shelter on site until the event has passed. Testing should not be resumed until the hazardous weather event is eliminated or it is determined that the weather concern does not pose a threat. In order to properly address the safety hazards that may be present during an inspection activity, a jurisdiction should determine the control (elimination, substitution, engineering, administrative, and personal protective) needed to minimize the hazard(s):

- Wind, including Tornado and Hurricane: Winds can move equipment. Wind gusts can be unexpected. Under these conditions testing should be halted at that point or when an alert notifies that risk of such wind is imminent or constant high wind is predicted or realized.
- Lightning: Lightning is a source of electricity and static generation. If lightning is in the area, then all equipment should be secured, if safe to do so, and personnel should immediately move indoors to a safe area. As lightning can travel a distance at speed, then a visual check of the sky or listening for thunder are not sufficient to ensure lightning is not in the area. The visual and audio cues can be used for confirmation, but primary detection

should be a tool to report lighting in the area. If no tool is available, then use the OSHA fact sheet on lightning as a minimum guide. Specifically, seek shelter when you see lightning 30 seconds or less after hearing thunder (if unable to see lightning than go to shelter at the first sound of thunder), then to wait 30 minutes after last sighting of lightning to go back outdoors.

- Flooding: Flash flooding may bring water to the location quickly. An inch of moving water can move equipment. Best practice is to avoid set up on poor draining, non-level surfaces. If flooding occurs on site, then secure equipment, if safe to do so, and move personnel to higher ground. Note that equipment stored outside and secured or chocked by light weight or floatable chock items is not sufficient. When chocking prover wheels, best practice is to secure the chocks (chain/attachment/lock) to the unit or locking chock system.
- Temperature extremes: It is best to plan ahead with a weather forecast to account for the day's high and low (including wind chill, humidity, and sun radiant heating) in the testing plan to avoid severe weather temperatures that turn equipment into hazards. The equipment components (metal, rubber, plastic), the tools (motors, hand tools) and people are affected. Know your equipment and personal limits on the temperature range that all can operate in. Determine safe operating temperatures before testing and monitor during testing. Know the appropriate temperature range for commodities to not only ensure test results are not influenced as a result of the thermodynamic effects (on air, the state of a commodity, equipment materials, etc.) causing either vaporization or icing of surfaces that can also render the equipment unsafe (to handle, walk on, or touch).

  Extreme hot or cold environments may be encountered outdoors or indoors (such as near heat producing machinery, ovens, exhaust ports, in refrigerated rooms, handling frozen tools). Note that wet conditions can translate the heat or cold to a person more quickly and may alter permitted exposure time limits. Consider a heat injury and illness prevention plan including exposure limits (an administrative control) and protection in the form of both clothing and PPE (personal protection control) and recovery plan.

2.27.1. Other Notification/Alerts. Any weather alert from a verified weather service should be given due consideration and may vary by region. A complete list of National Weather Service monitors are available on the National Oceanic and Atmospheric Administration-National Weather Service website at: **https://www.weather.gov/lwx/WarningsDefined**. Alerts from other national alert systems are an option and there are services, websites, and phone apps that assist in monitoring weather conditions in real time.

2.28. Wet/Slick Conditions.

Caution should be exercised when working in wet, slippery, or icy conditions to avoid slipping or possible injury from electrical sources. Shoes with non-skid soles should be worn to provide adequate traction to prevent slipping.

Absorbent material should be used on any product spills to prevent possible injury due to slipping on a slick surface.

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