

Glossary of terms and definitions

The following definitions are used in this document:

Acceptable entry conditions - the circumstances that must exist in a permit-required confined space to allow authorized entrants to safely enter into and work within the space

Administrative control - any procedure that limits hazard exposure (such as noise) by control of work schedules

Affected employee - an employee who operates or directly uses equipment that is serviced or maintained under lockout/tagout

Air, makeup - outdoor air supplied to replace exhaust air

Air-purifying respirator - a canister, cartridge, dust mask, or the like used to remove contamination from an atmosphere that contains a normal oxygen level

Article - a material that meets the following criteria:

- It is in a specific shape or design as a result of its manufacture
- It has an end-use function(s) dependent, in whole or in part, upon its shape or design during end use
- It doesn't release, or otherwise result in exposure to, a hazardous chemical under normal conditions of use

Asbestos - a group of naturally occurring minerals that separates into fibers; this group include chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite

Asbestos abatement - management activities that occur when it is likely that the action level (0.1 fibers per cubic centimeter (f/cc)) will be exceeded, such as during encapsulation or removal

Asbestos-containing material (ACM) - any material that contains 1% or more, by weight, of asbestos

Asbestos worker - an employee who is involved in asbestos abatement activities

Attendant - an individual stationed outside one or more permit-required confined spaces who monitors the authorized entrants and who performs the attendant's duties

Audiogram - a chart, graph, or table resulting from an audiometric test; an audiogram shows an individual's hearing threshold level as a function of frequency

Authorized employee - a person who locks out or tags out machines or equipment to service or maintain that machine or equipment. An affected employee becomes an authorized

employee when that employee's duties include servicing or maintenance covered under this section

Authorized entrant - an employee who is authorized by the employer to enter a permit-required confined space

Battery - one or more cells in a single package to provide direct current (DC) power source

Blanking or blinding - the absolute closure of a pipe, line, or duct by fastening a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that can withstand the maximum pressure of the pipe, line, or duct with no leakage beyond the plate

Bloodborne pathogens - pathogenic microorganisms that are present in human blood and can cause disease in humans; these pathogens include hepatitis B virus (HBV) and human immunodeficiency virus (HIV)

Bonding - minimizing the potential difference between conductive objects to prevent static discharge

"Capable of being locked out" - an energy-isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be attached, or it has a locking mechanism built into it. Other energy-isolating devices are capable of being locked out if lockout can be achieved without the need to dismantle, rebuild, or replace the energy-isolating device or permanently alter its energy control capability

Cell - basic unit for conversion of chemical energy to electrical energy and also for the reverse for rechargeable cells

Certifying officer - the person designated by the cognizant JSC line organization to administer the certification program

Chemical - any element, compound, or mixture of elements or compounds

Classes of fires -

- **Class A** - a fire involving ordinary combustible materials such as paper, wood, cloth, and some rubber and plastic materials
- **Class B** - a fire involving flammable or combustible liquids, flammable gases, greases and similar materials, and some rubber and plastic materials
- **Class C** - a fire involving energized electrical equipment
- **Class D** - a fire involving combustible metals such as magnesium, titanium, zirconium, sodium, lithium, and potassium

Close call - an occurrence in which there is no injury, no property or equipment damage, and no significant interruption of productive work, but which possesses a high potential for any of

the mishaps as defined in paragraph 106.3; for JSC, this will include mishaps resulting in only property damage less than \$1,000 in value

Combustible liquid - any liquid having a closed cup flash point at or above 100°F (37.8°C), but below 200°F (93.3°C), except any mixture having components with flash points of 200°F (93.3°C) or higher, the total volume of which makes up 99% or more of the total volume of the mixture; combustible liquids are subdivided as follows:

- **Class II** - those having flash points at or above 100°F (37.8°C) and below 140°F (60°C)
- **Class IIIA** - those having flash points at or above 140°F (60°C) and below 200°F (93.4°C)
- **Class IIIB** - those having flash points at or above 200°F (93.4°C)

Compensation - compensation payable under the Federal Employees Compensation Act; includes lost wage replacements, scheduled awards, medical expenses, money paid on account of death, and payments for approved vocational rehabilitation to employees who are disabled as a result of their employment

Competent person (for Chapter 7.2 only) - a person who has demonstrated the knowledge and skills necessary to administer certain aspects of JSC's respiratory protection program, such as emergency rescue from confined spaces, hazard assessments, air monitoring, fit-testing, and training

Confined space - a space of any size or shape that meets all the following conditions:

- It is large enough and so configured that an employee can enter and perform assigned work
- It has limited or restricted means for entry or exit (e.g., tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may limit means of entry)
- It isn't designed for continuous employee occupancy

Container - any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that may contain a hazardous chemical; in Chapter 9.2, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle that aren't considered to be containers

Contaminated - having the presence, or the reasonably anticipated presence, of blood or other potentially infectious materials on an item or surface

Continuation of pay (COP) - payment of employee's regular wages by the employing agency for time lost due to job-related, disabling traumatic injuries, with no charge to the employee's sick or annual leave; this period must never exceed 45 calendar days and doesn't need to be consecutive days; in cases where there is no immediate time loss, the first time loss following, due to the injury, is the first day of COP; this time loss must be taken within 90 days from the date of injury to begin using any balance of the 45 COP days

Contracting Officer - a designated person who performs administrative functions listed in the NASA Procurement Regulations

Contractor - a non-federal employer working under a NASA contract, whether as prime contractor or subcontractor

Cooling tower - a system used to dissipate heat from a building; it removes heat from water-cooled condensers of air-conditioning systems; the water in a closed loop is usually cooled by contact with outside air or by spray ponds

Costs (for Chapter 2.7 only) - direct costs of repair, retest, program delays, replacement, or recovery of NASA materials including hours, material, and contract costs, but excluding indirect costs of cleanup, investigation (either by NASA, contractor, or consultant), and injury, and by normal operational shutdown; materials or equipment replaced by another organization at no cost to NASA will be calculated at “book” value, including those mishaps covered by insurance

Credible failure - a failure that can occur and is reasonably expected to occur; in this handbook, failures of structure, pressure vessels, and pressurized lines and fittings aren't considered credible failure modes if those elements follow applicable safety factor requirements

Critical system - any facility support system or test system the loss of which could result in injury to test personnel, property damage, or failure to detect or shut off a hazardous condition

Cumulative trauma disorder (CTD) - a health disorder from repeated biomechanical stress due to ergonomic hazards; CTDs are a class of musculoskeletal disorder involving damage to the tendons, tendon sheaths, and the related bones, muscles, and nerves of the hands, wrists, elbows, shoulders, neck and back or synovial lubrication of the tendon sheaths

Decibel (dB) - a unit of measurement of sound pressure level; the decibel level of a sound is the logarithm of the ratio of sound pressure to a reference pressure; dB has meaning only when the reference is known; the internationally accepted reference pressure used in acoustics is 20 micropascals

Decibels, A-weighted (dBA) - a sound level reading in decibels made on the A-weighted network of a sound pressure level meter (SLM) at slow response

Disability - loss of ability to perform work; such loss may be partial or total and temporary or permanent

Disinfect - to remove contaminants and inhibit the action of agents that cause infection or disease

Dive team - underwater swimmers and support employees involved in an underwater operation, including the designated person in charge

Diver - an employee swimming in water using underwater apparatus that supplies compressed breathing gas at the ambient pressure

Double block and bleed - to close a line, duct, or pipe by:

- Closing and locking or tagging two in-line valves
- Opening and locking or tagging a drain or vent valve in the line between the two closed valves

Drop line - a vertical line from a fixed anchorage, independent of the work surface, to which a lanyard is affixed

Emergency (for Chapter 6.10 only) - any occurrence, including any failure of hazard control or monitoring equipment, internal or external to the permit-required confined space that could endanger entrants

Emergency Preparedness Plan - a written document intended to: mitigate the effects of a hazard; prepare (including preplanning) measures to be taken that will preserve life and minimize damage; describe responses to emergencies requiring the use of JSC resources and provide necessary assistance; and establish a recovery system that returns the center to normal operations after an incident

Emergency rescue services - the personnel designated to rescue employees from permit-required confined spaces

Employee representative - any official of any labor bargaining unit (such as a union) that represents civil service or contractor employees

Employer - under the JSC safety and health program, an “employer,” as used by OSHA, is the company for contractor employees and the supervisor for civil service employees

Enclosed environment - a test environment in a closed structure that has no venting, flow-through, or introduction of outside gases

Energized - connected to an energy source or containing residual or stored energy; any energy level above the magnitude listed below is automatically energized; any lesser magnitude or form of energy not listed must be evaluated on a case-by-case basis to determine whether this procedure is necessary to ensure safety

- **Electrical** - 50 volts
- **Thermal** - 130°F
- **Radiation** - any regulated source of ionizing or non-ionizing radiation
- **Chemical** - explosive, flammable, corrosive, or toxic solids, liquids, or gases

- **Mechanical** - flywheels, springs, suspended weights must be evaluated
- **Hydraulic or Pneumatic** - 150 psi

Energy control - an energy-isolating device placed on a system to isolate that system from operation. This form of energy control is used on various occasions to include long-term shutdown of the system for maintenance, construction, mothball, or demolition of the system. [Note: Energy control will not be accepted as the lockout protection for any employee. Each employee must use his or her own lock and tag to provide personal protection.]

Energy-isolating device - a mechanical device that physically prevents the transmission or release of hazardous energy, including, but not limited to:

- A manually operated electrical circuit breaker
- A disconnect switch
- A manually operated switch where the circuit conductors can be disconnected from all ungrounded supply conductors and no pole can be operated independently
- A slide gate
- A slip blind
- A line valve
- A block
- Any similar device used to block or isolate energy

Devices not included:

- Pushbuttons
- Selector switches
- Other control circuit-type devices

Energy source - any source of electrical, hydraulic, pneumatic, chemical (toxic, flammable, or corrosive material), thermal, or other energy

Engineering controls (for Chapter 7.2 only) - any method of controlling employee exposures to toxic materials by eliminating or modifying the source or reducing the quantity of contaminants released into the work environment

Engineering controls (for Chapter 7.4 only) - any method for isolating or removing a hazard from the workplace

Engineering controls (for Chapter 5.5 only) - engineered CTD risk control measures that include, but aren't limited to, devices such as workstations, tables, chairs, equipment, tools, and physical modifications to workstations, equipment, tools, production processes, or any other aspect of the work environment

Engulfment - the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the

respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing

Entry - the action by which a person passes through an opening into a permit-required confined space; entry includes work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space

Entry permit - the written document JSC Form 1476, which is a checklist that provides a systematic review of operational exposures in confined spaces

Entry procedure - the written document that details the required procedures and equipment required for safe entry into a specific confined space

Entry supervisor - the person who is responsible for determining whether acceptable entry conditions are present at a permit-required confined space where entry is planned, for authorizing entry, and overseeing entry operations, and for terminating entry as required by this program. (**Note:** An entry supervisor may also serve as an attendant or authorized entrant, as long as that person is trained and equipped as required by this program for each role that he or she fills. Also, the duties of an entry supervisor may be passed from one individual to another during the course of an entry operation.)

Ergonomic hazard - any workplace condition that poses a biomechanical stress to the worker; such hazardous workplace conditions include faulty workstation layout, improper work methods, improper tools, excessive tool vibration, and job design problems that include aspects of workflow, line speed, posture and force required, work/rest regimens, and repetition rate

Ergonomics - a multidisciplinary activity dealing with the interactions between a person and his or her total working environment, plus such traditional environmental elements as atmosphere, heat, light, and sound as well as all tools and equipment of the workplace

Explosive - a chemical compound, mixture, or device that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature; the term includes, but isn't limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, and igniters, any material determined to be within the scope of Title 18, United States Code, Chapter 40, "Importation, Manufacture, Distribution, and Storage of Explosive Materials," and also includes any material classified as an explosive by the Hazardous Materials Regulations of the U.S. Department of Transportation (NFPA 495, "Explosive Materials Code")

Exposure or Exposed - means that an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.), and includes potential (e.g., accidental or possible) exposure

Facility organization (for Chapter 6.9 only) - an organization that is responsible for operating and maintaining a test facility and that conducts tests for test-requesting organizations

Fire area - an area of a building separated from the rest of the building by construction with a fire resistance of at least 1 hour and having all communicating openings properly protected by an assembly having a fire resistance rating of at least 1 hour

Fire extinguisher - a portable device containing powder, liquid, or gases that are expelled under pressure to suppress a fire

First aid - any one-time treatment, and any follow-up visit for the purpose of observation, for minor scratches, cuts, burns, splinters, etc., that don't ordinarily require medical care; such one-time treatment, and follow-up visit for the purpose of observation, is considered first aid even when it is provided by a physician or registered professional personnel

Fit factor - a quantitative measure of the fit or sealing performance of a particular respirator to a particular individual; usually expressed as the ratio of challenge concentration outside the respirator to the concentration inside the respirator

Fit test - a test to determine an individual's ability to obtain a good face-to-face piece fit with a particular respirator. The outcome determines whether the required fit factor was achieved under a given set of physical conditions

Fixed anchorage - a secure point of attachment, not part of the work surface, for attaching drop lines, lifelines, or lanyards

Flammable - a chemical that falls into one of the following categories:

- **Aerosol, flammable** - an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening
- **Gas, flammable** - (1) a gas that ignites at ambient temperature and pressure when in a mixture of 13% by volume or less of air; or (2) a gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12% by volume, regardless of the lower limit
- **Liquid, flammable** - any liquid with a flash point below 100°F (37.8°C), except any mixture of components with flash points of 100°F (37.8°C) or higher, the total of which make up 99% or more of the total volume of the mixture (see classes below)

- **Solid, flammable** - a solid, other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that could cause a fire through friction, absorbing moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or that can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard; a chemical must be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis

Flammable liquid - a liquid having a closed cup flash point below 100°F (37.8°C) and having a vapor pressure not exceeding 40 psia (2068 mmHg) at 100°F (37.8°C) must be known as a Class I liquid with subdivisions as follows:

- **Class IA** - those having flash points below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C)
- **Class IB** - those having flash points below 73°F (22.8°C) and having a boiling point at or above 100°F (37.8°C)
- **Class IC** - those having flash points at or above 73°F (22.8°C) and below 100°F (37.8°C)

Flash point - the temperature at which a liquid gives off vapor sufficient to form an ignitable mixture with the air near the surface of the liquid or within the vessel used (as determined by appropriate test procedure and apparatus specified in NFPA 30) but insufficient to sustain a flame. It is also the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

- **Tagliabue Closed Tester** (see “American National Standard Method of Test for Flash Point by Tag Closed Tester,” Z11.24-1979 [ASTM D 56-79]) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that don’t contain suspended solids and don’t have a tendency to form a surface film under test
- **Pensky-Martens Closed Tester** (see “American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester,” Z11.7-1979 [ASTM D 93-79]) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test
- **Setaflash Closed Tester** (see “American National Standard Method of Test for Flash Point by Setaflash Closed Tester” [ASTM D 3278-78]) organic peroxides, which undergo auto-accelerating thermal decomposition, are excluded from any of the flash point determination methods specified above

Flight hardware - hardware intended to be used in space flight

Food - any raw, cooked, or processed edible substance, ice, beverage, or ingredient used or intended for use or for sale in whole or in part for human consumption

Food contact surface - those surfaces of equipment and utensils with which food normally comes in contact, and those surfaces from which food may drain, drip, or splash back onto surfaces normally in contact with food

Food service employee – AN individual having supervisory or management duties and any other person working in a food service establishment

Food service establishment - any place where food is prepared and intended for individual portion service, and includes the site at which individual portions are provided

Government vehicle - a commercially leased or U.S. government agency-owned motor vehicle that is being used in support of federal operations

Grounding - minimize potential difference between object and ground to prevent static discharge

Ground-level ambient atmosphere - the normal pressure and gas composition of the air surrounding the test facility or any other building

Group lockout/tagout (LO/TO) - when one individual, the group task representative, has placed red LO/TO tags and red LO/TO locks at all necessary points of energy isolation. All energy-isolation lock keys are placed in a group lockbox. The group task representative then places a red LO/TO tag and red LO/TO lock on the lockbox and maintains control of lockbox for the duration of the maintenance or service task. All authorized personnel will install their individual red LO/TO locks and tags on the lockbox to maintain their control during work. The task group representative is responsible for control of the lock box and key. The control responsibility of the task group representative can be transferred between shift changes and job reassignments

Hazard assessment - an evaluation by the Occupational Health and Human Test Support Office of the potential health hazards posed by a specific task or operation

Hazardous activity - one that involves credible risks or dangers to personnel or facilities and equipment of JSC; includes, but isn't limited to, activities associated with human-tended hypobaric chambers, zero-g testing, and the Energy Systems Test Area

Hazardous atmosphere (for Chapter 6.10 only) - an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to escape unaided from a permit-required confined space, injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10% of its lower explosive limit (LEL)
- Airborne combustible dust at a concentration that meets or exceeds its LEL
- Atmospheric oxygen concentration below 19.5% or above 23.5%

- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in 29 CFR 1910 Subpart G, “Occupational Health and Environmental Control,” or in 29 CFR 1910 Subpart Z, “Toxic and Hazardous Substances,” and that could result in employee exposure in excess of its dose or permissible exposure
Note: An atmospheric concentration of any substance that isn’t capable of causing death, incapacitation, impairment of ability to escape unaided, injury, or acute illness due to its health effects isn’t covered by this provision.
- Any other atmospheric condition that is immediately dangerous to life or health
Note: For air contaminants for which OSHA hasn’t determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets (MSDSs), can provide guidance in establishing acceptable atmospheric conditions

Hazardous chemical - any chemical that is a physical danger or a health danger

Hazardous material - any element, chemical compound, or mixture of elements or compounds that poses a physical or health threat to personnel, the environment, or the general public through planned or unplanned events; included in this definition are articles that fail any of the three tests under the definition of “Article” above

Hazardous material (for Chapter 9.1 only) - a substance that poses a danger to human health, safety, or the environment, or that meets the definition of a “hazardous chemical” under the hazard communication program (see OSHA 29 CFR 1910.1200 and Chapter 9.2 of this handbook)

Hazardous noise - a danger from noise exists whenever an operation, process, or procedure generates noise of sufficient duration and intensity to be capable of producing a permanent loss of hearing in an unprotected person

Hazardous operation - an operation that involves materials, conditions, or equipment that could result in personnel or property damage if special precautions aren’t followed

Hazardous test - a test where any test subject, test team member, observer, or member of the public is exposed to or has the potential to be exposed to a hazardous condition

Health hazard - a material “for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees; includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes” (29 CFR 1910.1200, Nov. 1983)

Hot-tap - a procedure that involves welding a piece of equipment while under pressure to install connections or appurtenances

Hot work permit - JSC Form 1475, “Hot Work, Welding, Cutting Permit” (Appendix 3B), which provides written authorization to perform operations (such as welding, riveting, cutting, burning, and heating) that could provide an ignition source

Human test facility - a facility testing hardware or procedures involving a human test subject

Hyperbaric environment - any atmosphere at an absolute pressure greater than ground-level ambient pressure by more than 0.1 psia

Hypobaric environment - see “Vacuum environment”

Immediately dangerous to life or health (IDLH) - any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual’s ability to escape unaided from a permit-required confined space. **Note:** Some materials—e.g., hydrogen fluoride gas and cadmium vapor—may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possible fatal collapse 12 to 72 hours after exposure. Such materials in hazardous quantities are considered to be “immediately” dangerous to life or health

Imminent danger - conditions or practices in any NASA/JSC or contractor workplace where a risk exists that could reasonably be expected to cause death or serious physical harm immediately or before the imminence of such risk can be eliminated through normal procedures; these will be identified by Risk Assessment Code (RAC) 1 (see Chapter 3.2)

Impulse or impact noise - variations in noise levels that involve peaks of intensity that occur at intervals of greater than 1 second; if the noise peaks occur at intervals of 1 second or less, the noise is considered continuous

Infectious waste - blood and blood products, contaminated sharps, pathological refuse, and microbiological refuse

Inspection - a comprehensive survey of all or part of a workplace by qualified employees to detect safety or health hazards; inspections are normally performed during the regular work hours of the agency, except as special circumstances may require

Institutional program - a distinct institutional activity or task conducted on JSC or contractor property and that requires the use of government or contractor ground-based resources; examples include facility design, construction, modification, demolition, repair, facility operations, test operations, manufacturing (fabrication) operations, service operations, and maintenance operations; space flight program operations conducted on orbit are excluded from this definition

Isolation (for Chapter 6.10 only) - the process by which a permit-required confined space is removed from service and completely protected against the release of energy and material into the space by such means as blanking or blinding; misaligning, or removing sections of

line, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages

Label - any written, printed, or graphic material that is displayed on or affixed to containers of hazardous chemicals

Label (for Chapter 9.3) - the written, printed, or graphic matter on or attached to a pesticide or device or any of its containers or wrappers

Labeling - a paper or written, printed, or graphic matter prepared by a registrant

- Accompanying the pesticides or device at any time; or
- To which reference is made on a printed paper or tag or in literature accompanying or referring to a pesticide or device, except accurate, non-misleading references made to a current official publication of a federal or state institution or agency authorized by law to conduct research in the field or pesticides

Laboratory - a facility concerned with the analysis of or experimentation with materials, substances, and equipment; also included are certain equipment, repair, and calibration operations and the processing of materials

Laboratory (for Chapter 6.6 only) - a facility in which individually operated, small-scale chemical operations are conducted or performed

Lanyard - a flexible line to secure a wearer of a safety belt or harness to a drop line, lifeline, or fixed anchorage

Lead - a heavy, soft, malleable, bluish-gray metal that may be in its metallic state, in inorganic compounds, and in organic soaps; excluded are all other organic compounds (e.g., the standard isn't designed to protect you from exposure to leaded gasoline)

Lifeline - a horizontal line between two fixed anchorages, independent of the work surface, to which the lanyard is secured either by tying off or by means of a suitable sliding connection

Lockout - placing a lockout device on an energy isolating device under established procedures and ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device - a device that uses a positive means such as a lock, either key or combination type, to hold an energy-isolating device in the safe position and prevent the energizing of a machine or equipment; included are blank flanges and bolted slip blinds

Lockout/tagout lock (red LO/TO lock) – Red-colored lock that is individually keyed and numbered. Used by an authorized employee to provide for securing energy isolation devices

and isolating energy from their active work area. Also, used by the task group representative for group LO/TO

Lockout/tagout tag – red-colored form JF1291 specifically used for energy isolation. Wording “DANGER, LOCKOUT TAGOUT”

Lost time case - a nonfatal traumatic injury that causes any loss of time from work beyond the day or shift on which it occurred; or a nonfatal nontraumatic illness or disease that causes disability at any time; for civil service employees, the time lost may be less than a full, 8-hour workday; for all other employees, only a full workday lost is counted

Lost workday cases - injuries and illnesses that involve days away from work or days of restricted work activity; this classification applies to contractor or private sector employees, not to civil service employees

Lost workday cases – away from work - the number of workdays (consecutive or not) during which the employee would have worked but couldn't because of an occupational injury or illness

Lost workday cases – restricted work activity - the number of workdays (consecutive or not) during which, because of injury or illness,

- The employee was assigned to another job on a temporary basis
- The employee worked at a permanently assigned job less than full time
- The employee worked at a permanently assigned job but couldn't perform all duties normally connected with the job

Lower explosive limit (LEL) - the minimum concentration of a combustible or flammable gas or vapor that will ignite if an ignition source is present; the terms “lower explosive limit” and “lower flammable limit” have the same meaning

Material Safety Data Sheet (MSDS) - written or printed material about a hazardous chemical that describes the characteristics, properties, associated hazards, and other relevant material

Medical care - for civil service employees, if an injury is accepted as compensable under FECA, the injured employee is entitled to all medical care that is required to cure, give relief, or reduce the degree or period of disability; it will be provided as long as the evidence indicates that it is needed for the effects of the job-related injury

Medical treatment - treatment administered by a physician, or by licensed or registered professional personnel under the standing orders of a physician, for an occupational injury or illness that doesn't result in days away from work or days of restricted work activity; doesn't include first-aid treatment, even though provided by a physician or licensed or registered

professional personnel; this definition applies to all employees, both civil servant and private sector

Mishap - any unplanned occurrence, event, or anomaly that meets one of the definitions below; injury to a member of the public while on JSC facilities is also defined as a NASA mishap:

- **Type A mishap** - a mishap causing death or damage to equipment or property equal to or greater than \$2M; mishaps resulting in damage to aircraft or space hardware, i.e., flight and ground support hardware, meeting this criterion are included; this definition also applies to a test failure if the damage was unexpected or unanticipated or if the failure is likely to have significant program impact or visibility
- **Type B mishap** - a mishap resulting in permanent disability to one or more persons, or hospitalization, for other than observation of three or more persons, or damage to equipment or property equal to or greater than \$500,000 but less than \$2M mishaps resulting in damage to aircraft or space hardware that meets this criterion are included, as are test failures where the damage was unexpected or unanticipated
- **Type C mishap** - a mishap resulting in damage to equipment or property equal to or greater than \$50,000 but less than \$500,000, or causing occupational injury or illness that results in a lost workday case; mishaps resulting in damage to aircraft or space hardware and test failures that meet these criteria are also included
- **Mission failure** - any mishap or event of such a serious nature that it prevents accomplishment of a majority of the primary mission objectives; a mishap of whatever intrinsic severity that, in the judgment of the Program Associate Administrator—in coordination with the Associate Administrator for Safety, Reliability, Maintainability, and Quality Assurance, NASA Headquarters—prevents the achievement of primary mission objectives as described in the Mission Operations Report
- **Incident** - a mishap consisting of less than Type C severity of injury to personnel, but more than first-aid severity, or property damage equal to or greater than \$1,000 but less than \$50,000; events that have small property loss, less than \$1,000, should be reported as incidents if they have significantly greater potential or high visibility

Mist - finely divided liquid suspended in air, usually generated by condensation or by dispersion of a liquid (e.g., by splashing, foaming, or atomizing)

Mixture - any combination of two or more chemicals if the combination isn't, in whole or in part, the result of a chemical reaction

Motor vehicle - a motor-propelled conveyance of a commercial design that provides transportation (personnel and cargo) and is capable of being licensed by the state or local authority having jurisdiction (e.g., automobiles, pickup trucks, buses, stake-bed trucks, and vans)

Must - indicates that the rule is mandatory; noncompliance with a “must” statement requires approval of a variance

NASA employee - any person other than detailed members of the Armed Forces and contractor employees required to work by NASA

Neutral Buoyancy Facility - test facility designed for simulating weightless conditions underwater involving personnel either in a pressure suit or wearing scuba gear

Noise hazard area - any work area with a noise level of 85 dBA or greater

Nominal - the root mean square (RMS) of the voltage; the RMS is a value assigned to represent the effective voltage and current levels of a power system

Nonopen water operations - underwater operations conducted in controlled environments under carefully prescribed laboratory or test conditions (such as swimming pools) that don't exceed depths beyond the no-decompression limit and that meet the exemption criteria of OSHA 29 CFR 1910.401(a)(2), Subpart T

Non-permit-required confined space - a confined space that doesn't contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm

Occupancy -

- **Assembly** - includes, but isn't limited to, all buildings or portions of buildings used for gathering together 50 or more persons for such purposes as deliberation, entertainment, amusement, or awaiting transportation
- **Business** - facilities used for the transaction of business, for the keeping of accounts and records, and for similar purposes
- **Industrial** - facilities devoted to operations such as processing, assembling, mixing, packaging, finishing or decorating, and repairing, including, among others, laboratories, power plants, pumping stations, and hangars (for servicing or maintenance)
- **Storage** - all buildings or structures used primarily for the stocking or sheltering of goods, merchandise, products, or vehicles; included, among others, are warehouses, freight terminals, and hangars (for storage only)

Occupational illness - an abnormal condition produced by systemic infection, continued or repeated stress or strain, exposure to toxins, radiation, high noise levels, etc., or other continued and repeated exposure to conditions of the work environment over a period of time longer than 1 day or work shift

Open water operations - operations conducted under any of the following conditions:

- In uncontrolled environments such as the open sea, in waterways, in lakes, and in rivers, which are strongly influenced by changes in the local environment

- At depths beyond the no-decompression limit
- Not otherwise exempt by OSHA 29 CFR 1910.401(a)(2), Subpart T, “Commercial Diving Operations” (see paragraph 220.4.2)

Occupational Safety and Health Administration(OSHA) recordable mishaps - an occupational death, injury, or illness that must be recorded subject to OSHA requirements in 29 CFR 1960 and 29 CFR 1904 on OSHA Form 300, the “Log of Occupational Injuries and Illnesses;” these are occupational deaths, nonfatal occupational illnesses, and those nonfatal occupational injuries that involve one or more of the following: loss of workdays – loss of consciousness; restriction of work or motion; transfer to another job; or medical treatment other than first aid; by OSHA definition, hospitalization of an employee for observation purposes only, without subsequent injury determination, isn’t a recordable injury

Other employee - an employee whose duties are routinely performed in an area or a facility where energy or material control procedures are used, but neither service nor operate the equipment requiring energy or material controls

Other potentially infectious materials - includes

- Semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, and any body fluid that is visibly contaminated with blood
- Any unfixed tissue or organ (other than dead skin) from a human (living or dead)
- HIV- or HBV-containing cells or tissue cultures, organ cultures, and culture medium; and blood, organs, or other tissues from experimental animals infected with HIV or HBV

Oxygen-enriched environment - from ASTM G 63-99 1999, a fluid (gas or liquid) that contains more than 25 mol % oxygen (oxygen greater than 25% by volume).

Permissible exposure limit (PEL) - the maximum time-weighted concentration of asbestos generally considered or recognized as having no adverse long- or short-term effects; OSHA has established 0.2 f/cc on an 8-hour basis and a 1.0 f/cc excursion limit on a 30-minute basis as the PEL and has structured the regulatory program for control of asbestos accordingly

Permit-required confined space - a confined space that has one or more of the following characteristics:

- Contains, or has the potential to contain, a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section
- Contains any other recognized serious safety or health hazard

Personal protective equipment (PPE) - clothes, padding, gloves, devices, equipment, or other items worn on or attached to the body that are used for the purpose of controlling CTD risk (lumbar supports aren't PPE)

Pesticide - a substance or mixture of substances intended to prevent, destroy, or mitigate any pest, or any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant

Physical hazard - a chemical for which there is scientifically valid evidence that it is a combustible liquid, a gas, an explosive, a flammable, an organic peroxide, an oxidizer, a pyrophoric, unstable (reactive), or water-reactive

Physiological training - training to familiarize personnel who are exposed to a lowered or increased barometric pressure with the physiological stresses encountered and the means for overcoming these stresses

Powered air-purifying respirator - an air-purifying respirator that supplies cartridge-filtered breathing air to the facepiece by means of a battery-operated pump

Primary - cell or battery that isn't to be recharged

Primary cause - the major anomalous event immediately preceding a mishap in the absence of which the mishap wouldn't have occurred

Probability - the likelihood that an identified hazard will result in a mishap based on an assessment of such factors as location, exposure in terms of cycles or hours of operation, and affected population

Produce - to manufacture, process, formulate, or repackage

Prohibited conditions - any condition in a permit-required confined space that isn't allowed during the period when entry is authorized

Prohibited material - a hazardous material that is extremely hazardous to human health, safety, or the environment and must never be purchased or used for any purpose without a waiver from the Hazardous Review Subcommittee

Propellants - explosive substances that normally function by deflagration and are used for propulsion purposes; such substances may be Class A or Class B explosives, depending on susceptibility to detonation (Class A explosives pose detonating or otherwise maximum hazard, such as dynamite or desensitized nitroglycerin; Class B explosives pose flammability hazards, such as smokeless propellants or photographic flash powders)

Protective clothing - an article of clothing worn essentially for personal safety and protection while performing work assignments in hazardous areas, under hazardous conditions, or under controlled environmental conditions of clean rooms, laboratories, etc. Typical items of

protective clothing are steel-toe shoes, hardhats, fire-retardant and acid-resistant clothing, cryogenic handler suits, gloves, aprons, etc.

Protective equipment - a device or item that is worn or used for the safety and protection of personnel or the public when entering or working in hazardous areas or under hazardous conditions; devices or items include, but aren't limited to, respirators and gas masks, welding helmets and shields, safety goggles and spectacles, safety belts and lifelines

Pyrophoric - a chemical that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below

Qualified person - for purposes of verifying isolation under paragraph 9.b, this is an employee that an employer has specifically identified as having sufficient training to verify previously energized parts are free of energy.

Reactive - a chemical that, in the pure state or as produced or transported, will vigorously polymerize, decompose, condense, or become self-reactive under conditions of shocks, pressure, or temperature

Reprisal - any act of restraint, interference, coercion, or discrimination against any employee for exercising his or her rights under Executive Order 12196, 29 CFR 1960, or for participating in JSC's safety and health programs

Respirator users - personnel who use any type of respirator for any purpose, regardless of frequency (includes routine, emergency, and escape-only users)

Restricted material - a hazardous material that is identified as posing a significant risk to human health and safety or the environment, therefore requiring the special attention of management.

Retrieval equipment - the equipment (including rescue line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit-required confined spaces

Safety and Health Inspector - a safety or occupational health specialist or other trained person authorized to carry out inspections and who has the equipment and competence to recognize safety or health hazards in the workplace

Safety and health training - imparting safety and health knowledge or skills to an individual or group of individuals; this may be done by various methods, such as classroom instruction, safety meetings, videotape or multimedia programs, etc.

Safety belt or harness - a device for the specific purpose of securing, suspending, or retrieving a worker in or from a hazardous work area; examples include the following:

- **Body belt** - a simple or compound strap with means for securing it about the waist and a lanyard to it
- **Body harness** - a design of simple or compound straps that may be secured about the wearer in such a manner as to distribute the stopping forces over the thighs, buttocks, chest, and shoulders, or any combination thereof, and with provisions for attaching a lanyard in the back between chest and shoulder level
- **Chest harness** - a design of simple or compound straps with means for securing it about the rib cage, with shoulder straps to ensure proper chest strap positioning, and with provisions for attaching a lanyard in the back between chest and shoulder level
- **Suspension belt** - a design of simple or compound straps that may be secured about the wearer's body as an independent work support; these are commonly referred to as saddle belts, bosuns' chairs, or tree trimmers' belts

SCUBA diving - a diving mode independent of surface supply in which the diver uses open-circuit, self-contained underwater breathing apparatus

Sealed - free of cracks or other openings that allow moisture to enter or leave

Secondary - cell or battery that is rechargeable

Self-contained underwater breathing apparatus (SCUBA) - a respirator that supplies breathing air from a compressed air cylinder carried by the user

Serious - as used in "serious hazard," "serious violation," or "serious condition;" means a hazard, a violation, or conditions such that there is a substantial probability that death or life-threatening, or long-term or permanent disabling physical harm could result should a mishap occur while the hazard, violation, or conditions exist

Servicing or maintenance - constructing, installing, setting up, adjusting, inspecting, modifying, maintaining, or servicing equipment or machines. These activities include lubrication, cleaning, un-jamming, making adjustments to machines or equipment, or tool changes where an employee is exposed to unexpected energizing or startup of the equipment or release of hazardous energy

Shift change (Chapter 8.2) - the period during which one group of workers is replaced by another group of workers. This can also be when an individual no longer remains in the work area, leaving to work elsewhere, or leaves the site or facility for the day. At these times, the individual must remove the individual red LO/TO tags and locks. Tags may be put in place or already in place through group LO/TO and controlled by the group task representative

Note: Other organizations may define shift change differently in their health and safety plan policies and procedures

Should - indicates that the rule is a recommendation, the advisability of which depends on the facts in each situation; implementation of a “should” statement is at the discretion of the local officials

Sound level meter (SLM) - an electronic instrument for measuring sound levels that conforms to the requirements for a Type II sound level meter as specified in ANSI S1.4-1971

Supplied air respirator - a respirator that supplies breathing air under positive pressure from a clean source to the face piece

Survivor benefits - survivors of employees who die as a result of job-related injuries or illnesses are entitled to income continuation and reimbursement for medical and burial expenses; the portion of the employee’s salary that is awarded to survivors depends on the survivor number and dependency status; annual cost of living adjustments are provided

System (for Chapter 8.2 only) - equipment such as piping, wiring, or ducting designed to store, process, or deliver utilities or commodities. Some examples of hazards associated with systems are fluid pressure, temperature, hazardous liquids and gasses, and electricity

Tagout - placing a tagout device on an energy-isolating device according to procedure to indicate that the energy-isolating device and equipment being controlled may not be operated until the tagout device is removed

Tagout device - a prominent warning device such as a tag and means of attachment that can be securely fastened to an energy-isolating device under an established procedure to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed

Test - an activity conducted to accomplish any of the following where persons or hardware are subjected to one or more test environments:

- Acquire data
- Evaluate, qualify, or certify hardware
- Train space flight crews
- Demonstrate capabilities

Laboratory analysis, research, and experimentation that doesn’t involve human subjects, flight hardware, prototype hardware, explosives, and oxygen-enriched atmospheres isn’t considered testing

Test chamber - altitude chambers, vacuum chambers, and hyperbaric chambers, together with their ancillary systems and equipment, that provide an atmosphere deviating from ground-level ambient pressure or oxygen content or that involve a closed-loop life support system

Test environment - a condition to which a test system or test subject is subjected; a test environment may involve deviation from normal ground-level ambient atmosphere, the application of higher forces or energy levels (i.e., acoustic, potential, thermal, etc.) than normally experienced, or exposure to hazardous materials

Test Equipment – portable hardware that is unique to a specific test or training exercise, does not require integration into the test facility (i.e. plug-in versus hard-wired), and is removed immediately after the test.

Test facility - structures in which testing operations are conducted; the test facility includes the housing structure and all permanently installed systems specifically for test support; not included are generic utilities servicing other parts of the building or other facilities

Test facility support systems - permanently installed equipment that support testing operations

Testing - the process by which the hazards that may confront entrants of permit-required space are identified and evaluated, including specifying the tests that are to be performed in the space

Test subject - a human being who is subjected to a test environment, often with little or no control over the test process

Time-weighted-average (TWA) sound level - the sound level that, if constant over an 8-hour workday exposure, would result in the same noise dose as is measured

Users of hazardous material - personnel who open the incremental hazardous material shipping container and thereby expose the material for the purpose of mixing, transferring, burning, freezing, pouring, venting, reacting, disposing of, or otherwise using or altering the material

Vacuum environment - any atmosphere at an absolute pressure less than ground-level ambient pressure by 0.5 psia; also known as hypobaric environment

Vapor - a gaseous form of a substance that is normally in the solid or liquid state at standard temperature and pressure

Waiver - documented and approved permission to perform some act contrary to established requirements

Work area - a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present

Workplace - a physical location where NASA's work or operations are done

Workplace (for Chapter 9.2 only) - an establishment, job site, or project, at one geographical location containing one or more work areas