

Process Hazards and Associated Controls

Description of controls	
Engineering controls	These are physical and mechanical systems to eliminate a hazard, control it, or isolate it from workers. They include ventilation systems, restricted areas, and mitigation and alarm systems.
Work practice controls	These are safe work practice procedures for hazardous conditions. Examples include permitting and authorization requirements, work scheduling, and training.
Personal Protective Equipment (PPE)	This is equipment that is used in addition to engineering and work practice controls to further reduce risk to workers. Examples of PPE include respiratory protections, gloves, hard hats, steel-toed boots, and safety glasses.

Safety and health hazards and example controls	
Hazards	Controls
Electrical – electrocution, ignition, and heat sources	electric codes, electrical safety and lockout /tag-out procedures, and interlocks
Low or high pressure – low pressure, implosion from vacuum systems, high pressure energy releases from compressed gas cylinders, pressure vessels, steam generators, air compressors and receivers, and associated systems	design standards, pressure relief devices, blast containment and shielding, hydrostatic testing and inspection, and access control
Temperature extremes – cryogenic gases, heated or cooled materials, heat-generating processes, and extreme weather conditions during outdoor activities	engineering controls, handling and use procedures, access controls, warnings, and PPE
Hazardous materials – flammables, combustibles, toxics, corrosives, reactives, allergens, or carcinogens	engineering controls, chemical hygiene plan, storage and handling procedures, and PPE
Noise – equipment and processes generating high sound levels	engineering controls and PPE
Radiation sources (non-ionizing) – intense UV light sources and solar radiation	enclosures, interlocks, work procedures, and PPE
Natural environmental conditions – extreme weather, insects, snakes, and other wildlife	facility design, work procedures, and PPE
Machinery/equipment – moving parts, energy sources, falling or shifting loads, and vehicle hazards	guarding, operating procedures, operator certifications, inspection and maintenance programs, lockout/tag-out procedures, and PPE

Environmental Hazards and Example Controls	
Air and water emissions – air and water effluent streams	work practice controls, environmental plans, and permits identified by type and anticipated volume.
Hazardous waste – characterized hazardous waste	work practice controls identified by type and anticipated volume, including handling and storage procedures.
Waste minimization – identified hazardous waste.	list of all reasonable techniques for minimizing waste using environmental policies and procedures
Decommissioning – potential contamination	decontaminating procedures and PPE