CHAPTER 2 DEFINITIONS & RESPONSIBILITIES

Terms defined in Webster's New Collegiate Dictionary or in IEEE Standard 100 are not included in this Chapter 2. Terms defined and used within a single Chapter or paragraph of this Section 2.0 are not included in this Chapter 2. Other terms are defined below. Abbreviations of professional organizations are spelled out in Chapter 16 of this document and in DOE Order 6430.1A,"General Design Criteria."

2.1 DEFINITIONS

2.1.1 Authorized Person – a Qualified Person who is directed to work on a task by a Supervisor having the responsibility and authority to do so.

2.1.2 Emergency-Shutdown Pushbutton (E-Stop) – A control device designed to initiate removal of energy to experimental devices in the area during an emergency.

2.1.3 Energy Barrier – Restricts or shunts an energy source from a worker. See Chapter 4, paragraph 4.3.1 for description.

2.1.4 General-Access areas – Areas that do not present hazards to personnel while equipment and systems are functioning normally. These areas are accessible to all personnel. See Chapter 4, paragraph 4.12.1 for details.

2.1.5 Grounding Stick (Hook) – An insulating device used for discharging and/or temporarily shorting and grounding de-energized high-energy-storage systems and electrical circuits. See Chapter 15, paragraph 15.2 for requirements.

2.1.6 Insulated Hand Tools- Industrial-grade hand-tools hot-dipped with insulating material in order to protect the user from electric shock and to minimize the risk of short circuits between live parts operating at different potentials. The insulation on all such tools shall have a durable second or " tell-tale" coating of contrasting color to evidence potential damage. Insulated tools shall comply with the requirements of IEC Standard 900 and ASTM F1505. Use is limited to circuits of 600 v and less and when used in accordance with paragraph 3.3 in Chapter 3. Use of insulated tools satisfies the requirements of OSHA, Part 29 CFR 1910.335(a)(2). Insulated hand tools do not include:

A. Tools and equipment supplied from an external energy source, such as portable hand-held electric drills, grinders, or saws,

B. Insulating rods and poles used for working at a distance.

2.1.7 Interlocked-Access areas – Areas in which the sources of power must be interlocked with the access doors because of the hazards contained inside. See Chapter 4, paragraph 4.12.3 for details.

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2.1.8 Life Cycle – Phases of work performed on the facilities, plant, and projects of this Laboratory. The phases include designing, fabricating, installing, testing, operating, maintaining, and decommissioning.

2.1.9 Limited-Access areas – Areas that are kept locked and are accessible only to authorized personnel because of the hazards contained inside. See also Chapter 4, paragraph 4.12.2 for details.

2.1.10 Live Part(s) – Unguarded bare conductors operated over 50 V, see NEC Article 110-27 and unguarded insulated conductors operated below 600 V, see NEC Article 110-26(a)(1), are considered live parts. see NEC articles 110-30 through 110 -34 for conductors over 600 V.

2.1.11 Positively De-energized – See Chapter 3, paragraph 3.3.2 (A) for details.

2.1.12 Personnel-Safety-Interlocked Systems – Includes one or more of the emergency-shutdown systems and/or personnel-access-control systems described in Chapter 5.

2.1.13 Qualified Person – One who has been trained to be familiar, and knowledgeable with work processes, procedures, activities, hazards involved, and the actions required to mitigate the consequences of accidents that might occur with respect to the equipment or work method (See table 3.3 for minimum training requirements).

2.1.14 Safety Barrier – A barrier that separates a worker from an energy source by time and distance. For detailed criteria, see Chapter 4, paragraph 4.3.4.

2.1.15 Safety Interlock – An electrical and/or mechanical device provided to prevent hazardous operation of equipment or to inhibit unsafe access to areas, enclosures, or equipment. see Chapter 5 for detailed criteria.

2.1.16 Safety-Interlock-Coordinator – Provides oversight on the PPPL Personnel Safety Interlock systems and their components. See paragraph 2.2.4 for details.

2.1.17 Safety Watch – Monitors the work process of authorized personnel, when they are engaged in potentially hazardous activities, to help prevent unsafe acts. See paragraph 2.2.6 for details.

2.1.18 Temporary wiring – may consist of extension cords, flexible cords, multiple outlet boxes, and power strips. Temporary wiring is installed during periods of construction, emergencies, testing, experiments, and developmental work and is not to be used in place of permanent wiring. Temporary wiring shall be removed upon completion of construction or purpose for which the wiring was installed. See Chapter 3, paragraph 3.3.9 for details and permitted use of temporary wiring..

2.1.19 Voltages (High and Low)

A. High Voltage – circuits designed to operate above 600 V.
(Class E circuits…Nominal operating voltage above 600V)

B. Low Voltage – circuits designed to operate at 600 V and below.
(Class A circuits…Nominal operating voltage below 50V)
(Class B circuits…Nominal operating voltage 120/208 V)
(Class C circuits…Nominal operating voltage 240V)
(Class D circuits…Nominal operating voltage 480/277V)

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2.1.20 Work – Electrical work performed on or near live circuits is divided into three risk-categories which are -:

A. **High-risk** tasks that include performing electrical connections or equipment alterations or adjustments to live parts and shall require an "Energized Work Permit" (see chapter 3, para. 3.3.3 B).

B. **Moderate risk** tasks that include monitoring or testing on live parts, troubleshooting, voltage measurements, and diagnostic testing equivalent to placing suitably insulated probes or using Class 0 protective gloves to place un-insulated clip-on test leads on energized conductors.

C. **Low risk** tasks that include observing or visually inspecting live parts from a safe distance to locate malfunctions such as arcs, overheating and excessive noise.

2.2.21 Testing/Troubleshooting, Diagnostic and Voltage Measurements-
A work routine designed to locate malfunctions, determine performance characteristics, and for acceptance tests. A person is considered working at a moderate risk when performing these routines and shall have performed a job hazard analysis and determined the proper personal protective equipment (PPE) required for the task as required per approved procedures prior to the start of work. See chapter 3, para. 3.3.3 A & B for more information.

2.1.22 Working Alone - A person is considered working alone when not within earshot or visual contact with another employee for more than a few minutes at a time. PPPL Policy P017 provides guidelines when a person may work alone and when working alone is prohibited. See Chapter 3, paragraph 3.3.of Section 2 for General Electrical requirements.

2.2 RESPONSIBILITIES

2.2.1 Managers and Supervisors

All department heads, division heads, branch heads, section heads, cognizant engineers, and supervisors are responsible for implementing Section 2. (Electrical Safety) within their organization. Supervisors shall:

A. Assure that all employees under their supervision whose duties require them to work with electrical equipment, are qualified to the appropriate level and as a minimum are trained to:

1. Recognize and report hazards and violations of this Section 2.0.
2. Assure the use of appropriate facility safety signs, warning lights, and barricades where required by PPPL ESH 002 and this Section 2.0.
3. Observe safe operating procedures and practices.
4. Use approved Lockout/Tagout and safety-tagging procedures where required by PPPL ESH 016, PPPL ESH 001, and this Section 2.0.

B. Implement properly approved and authorized variances from this Section 2.0.

C. Ensure that safety guards, barriers or protective measures are satisfactory for the work conditions.

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2.2.2 Design Engineers and their Supervisors

To help assure that the design provides all of the necessary safety features and meets all of the safety requirements, standards, and codes, design engineers and their supervisors shall review and approve single-line drawings, electrical-arrangement drawings, and schematics/elementaries associated with:

A Capacitive or inductive devices that are capable of storing energy of 10J or more.

B. Systems operating at or producing 250 V nominal or greater.

C. Systems that are adjacent to other systems, where faults or arcs can result in producing voltages of 250 V nominal or greater.

2.2.3 Electrical Safety - Interlock Coordinator

The responsibilities of the Electrical Safety-Interlock Coordinator include:

A. Reviewing the design of new personnel-safety-interlock systems and modifications to existing systems in light of existing and new standards for such systems.

B. Verifying the initial-installation, modification, and testing of every new Personnel Safety Interlock System (P.S.I.) at PPPL. After initial verification, the systems revert to the Project / Operations personnel for routine maintenance testing at a frequency specified in Chapter 5, paragraphs 5.8.4.B and 5.8.4.C. Maintain copies of PSI test data when received from Project Safety Interlock coordinator.

C. Encouraging standardization and uniformity in the design or modification of personnel-safety-interlock systems.

2.2.4 Project-Interlock Coordinator

The responsibilities of the Project-Interlock Coordinator include:

A. Reviewing the design of new personnel-safety-interlock systems and modifications to existing systems for their Projects.

B. Coordinates initial-installation, modifications, and testing of all their Projects Personnel Safety Interlock System (P.S.I.).

C. Coordinates routine maintenance testing at a frequency specified in Chapter 5, paragraphs 5.8.4 (B) & (C). Using the due dates on the Preventative Maintenance data base cards ensures that the testing is completed in a timely fashion.

D. Maintains the original P.S.I. test data files or sends original test procedures to Central Files and forwards a copy to Electrical Safety.

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2.2.5 Key Custodian (KC)

The Key Custodian is a PPPL employee with technical knowledge of the Lab-wide interlock key system who keeps all the spare interlock keys secure and issues keys upon receipt of an approved request form. (See PPPL Procedure ENG 011.)

2.2.6 Safety Watch

A Safety Watch serves the minimum requirements that are specified in OSHA, 29 CFR 1910.335(b)(3), for an " Attendant."

A. The qualifications of a Safety Watch shall be:

1. Thorough instruction in the locations and the operating sequences of emergency-shutdown pushbuttons and power disconnecting means.

2. Thorough instruction in the specific working procedures to be followed and the work to be completed.

B. The specific responsibilities of a Safety Watch are:

1. Under normal conditions, the primary responsibilities shall be to attempt to prevent careless acts by observing workers and operations being performed and stopping any unsafe activities. A Safety Watch shall be provided with the personal protective equipment necessary for the potential hazards that are coincident with the task(s). A Safety Watch may initial check-list steps during the execution of a procedure if the primary responsibilities are not jeopardized.

2. Maintaining visual and audible contact with the person performing safing functions that are generically described in Chapter 3 paragraph 3.3.2 (B).

3. Establishing emergency communication (with ESU) to obtain assistance, when necessary.

4. Removing an injured person (except in confined space) from any hazards without becoming the second victim.

5. Verify that the worker is wearing the appropriate protective equipment when he or she is working under the minimum requirements for hands-on work as defined in Chapter 3, paragraph 3.3 and NFPA 70E Tables 3-3.9.1, 3-3.9.2, 3-3.9.3.

6. Under emergency conditions, quickly de-energizing equipment and alerting personnel from the Emergency Services Unit (ESU) Ext.3333.

7. If there is an accident, advising the arriving ESU personnel of the hazards present.

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C. Safety Watch Actions for an Electrical Fire

1. Contact ESU (ext, 3333) or by radio. Stay on line until ESU terminates contact.
2. Evacuate area by word of mouth and/or fire alarm.
3. If safe to do so de-energize circuit or cut power off to area.
4. Remove flammables from area if safe to do so.
5. Exit area and notify ESU if any known hazards are present.

D. Safety Watch Actions for Electric shock

1. Contact ESU (ext. 3333) regardless of severity of the shock. Give name and location.
2. Remove victim from the electrical source by shutting down power if possible or by using a non-conductive pole (tested fiber glass).
3. Keep victim calm, sitting or laying down.
4. If victim has apparent injuries, keep still to prevent further injury.
5. Keep other personnel out of the area to avoid additional victims.
6. If first aid or CPR is indicated, treat victim appropriately.
7. Notify ESU of any known hazards that may be present.

Note: There is a high success rate when applying CPR to shock victims in respiratory arrest.

2.2.7 All Employees

All employees are responsible for performing tasks in accordance with established safety rules and procedures. They shall not act in any manner that exposes them or their fellow employees to health hazards or to the risk of injury. Additionally, they shall report all observed unsafe conditions to their supervisor or to others per procedure GEN-011, “ES&H Deficiency Reporting”.

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