

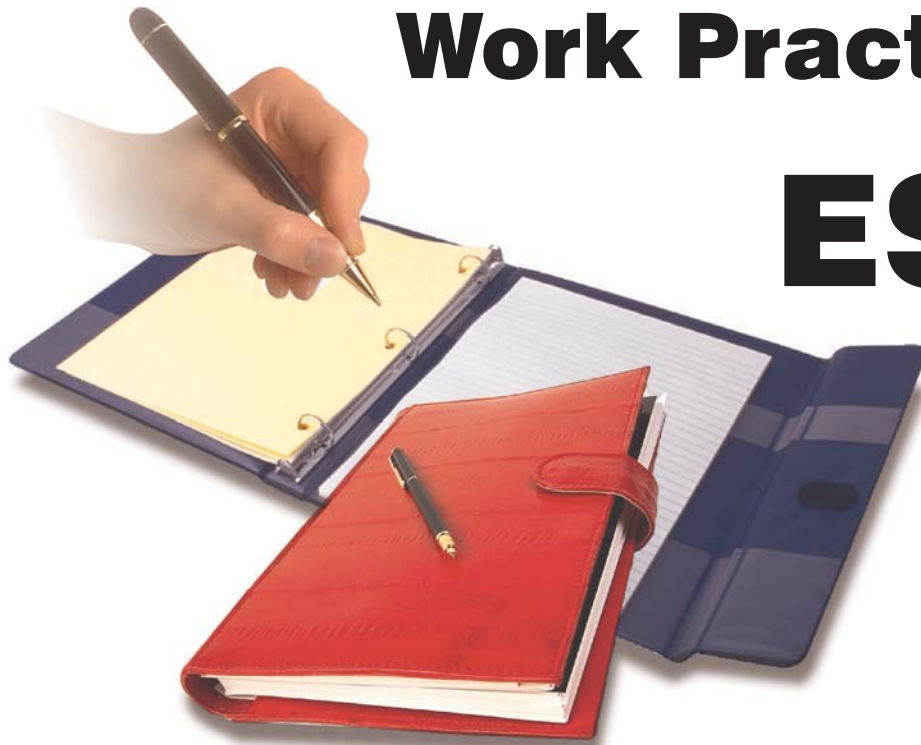


DELPHI

UAW-Delphi

Electrical Safe Work Practices

ESWP



Implementation Guidelines

UAW-GM Center for Human Resources
Health & Safety



Implementation Guidelines

Scope and Application

The Electrical Safe Work Practices program (ESWP) was developed to protect workers who are exposed to electrical hazards resulting from electric shock and arc flash. This booklet provides guidelines for implementing the UAW-Delphi Electrical Safe Work Practices (ESWP) program. This program, properly implemented, will protect workers from the potentially significant hazards associated with work involving electrical energy and the related machinery, equipment or other electrical installation. These guidelines cover the following areas, which outline requirements of this program.

Implementation Process

- Overview of the Implementation Process
 - Policy and purpose of the ESWP program.
 - Implementation Process.
 - Personal Protective Equipment (PPE) requirements.
- Training Requirements
 - Training Materials
 - ESWP Employee Handbook
 - ESWP Handbook interactive CD program
- Electrical Hazard Analysis
 - Initial “HIGH ENERGY” Survey
 - Enclosure to Bus Survey
 - Electrical installation labeling

Implementation Guidelines

Roles and Responsibilities

- Plant Safety Review Board
- Local Joint Health and Safety Committee
- First Line Supervisors
- Subject Matter Experts (SME)
- Personnel Working on Electrical Equipment
- ESWP Trainers
- Divisional Safety Managers

In addition to these guidelines, other detailed resource information about these topics are available on the Electrical Safe Work Practices – Implementation Resources CD.

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Implementation Process

Policy and Purpose

It is the policy of Delphi Corporation to have employees lock out all equipment energy sources prior to installation, repair, or replacement in order to prevent or eliminate hazards. The Electrical Safe Work Practice program specifically reinforces the need to fully comply with the UAW-Delphi Lockout Energy Control procedure; however, we recognize there are situations (e.g., troubleshooting) during which some power must remain on to complete the tasks. The information contained in this document describes the philosophy, policies, and procedures required to support electrical safety for Delphi Corporation.

The Electrical Safe Work Practices program is based on the Delphi Corporation “Standard For Electrical Safe Work Practices” prepared by Facilities Services Group, Technical Services. The Delphi standard parallels the voluntary consensus standards identified in the National Fire Protection Association (NFPA) Standard 70—E for Electrical Safety Requirements for Employee Workplaces, relevant OSHA standards and other consensus standards from the American Society for Testing Materials.

The purpose of this program is to prevent incidents and injuries related to electrical work. This shall be accomplished by providing all employees who may be exposed to electrical hazards while working in their facilities with the proper training, instruction, and personal protective equipment and tools to perform their job safely.

It is Management’s responsibility, with support from the Union, to foster an environment in which safety is the first priority in everything we do. Management must provide the time, funds and resources needed to fully implement the Electrical Safe Work Practices program. It is every employee’s right and responsibility to receive the required training, to follow established local procedures and to use appropriate personal protective equipment (PPE) when required. All employees also have the right and responsibility to seek the counsel of local leadership in the event a situation occurs which the employee believes may be unsafe or violates the requirements of the Electrical Safe Work Practices program.

Additionally, management shall ensure that anyone (e.g. engineers, contractors, etc.) who may be exposed to electrical hazards be required to comply with all provisions of this program. This includes the personal protective equipment requirements identified locally by each facility.

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Implementation Process

The Electrical Safe Work Practices program has many significant elements, which need to be addressed and planned for during the implementation phase. This includes training, personal protective equipment (PPE), and the Electrical Hazard Analysis process.

The Plant Safety Review Board will identify and designate one or more management person(s) as the facility's Subject Matter Expert (SME) to assist in implementing this program. The SME should be an electrical engineer or an otherwise qualified person with extensive knowledge of electrical engineering concepts and the facility's electrical systems and installations. The primary role of the SME is to provide technical support during implementation of all aspects of this program and to answer technical and general questions about electrical safe work practices.

Next a facility ESWP Implementation Team should be formed. This team will become familiar with the contents of this guide and other supporting documentation to assist the leadership in implementing the UAW-Delphi ESWP program. Although each Plant Safety Review Board will determine the local make up of their ESWP team, it is important to identify members who have appropriate knowledge and skills to support the implementation process and to ensure compliance with program. This team should be made up of individuals having special skills and experience in electrical work, plant engineering, maintenance, skilled trades and health and safety. The Plant Safety Review Board will monitor the progress of program implementation.

The need for leadership commitment to support this program and the culture change required for full implementation cannot be understated. Therefore an important part of this program rollout will be communicating key program elements to all affected employees. Initially, this can be accomplished through team meetings or other methods.

Additionally, the UAW-Delphi Electrical Safe Work Practices training is required for electrical workers, which will be provided by locally selected trainers at each facility. This training will be supported by and delivered in conjunction with the facility's Subject Matter Expert.

Trainers for the UAW-Delphi Electrical Safe Work Practices training program should be selected based on the following criteria:

- Ability to communicate effectively with others.
- Self-motivated with leadership skills.

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- Have knowledge and experience with the JCATs computer assisted training process.
- Respected by local union and management leadership and by those attending training.
- Have appropriate subject matter knowledge and experience.
- Dedicated to quality health and safety training.

Note: It is highly recommended that trainers be qualified electrical workers.

Personal Protective Equipment (PPE) Requirements

The personal protective equipment (PPE) requirements are intended to protect workers from arc flash and shock hazards. All employees who may be exposed to electrical hazards during any aspect of their work will wear appropriate flame-resistant uniforms and other PPE as required. The degree of protection required is determined by a facility wide Electrical Hazard Analysis. This analysis consists of an arc flash hazard assessment and other supporting electrical surveys identified in this program.

Initially, and until the facility wide Electrical Hazard Analysis has been completed, standard uniforms rated for level 2 flame-resistant (FR) protection (NFPA 70E) are required as daily wear for all electrical workers and others who may be exposed to electrical hazards.

These uniforms are available in a shirt/pant combination or as coveralls and will be provided at no cost to the employee. Appropriate clothing must be worn under the uniform, 100% cotton is preferred. Synthetic materials must not be worn under the uniform because it could melt to the skin if a significant arc flash incident occurred. The type of uniform (shirt/pant or coveralls) to be provided at each facility will be determined by the Plant Safety Review Board.

Rubber insulating gloves, rated class E-00 (500 volts & under), and leather protector gloves will also be provided. Additionally, hard hats with arc flash face shields will be provided when the distance a worker is from the potential arc flash hazard requires it.

Higher levels of arc flash protection, such as full body flash suits and high voltage gloves are required for work where potential arc flash hazards exceed the protection provided by the level 2 FR protective clothing. This type of protective clothing will be available as needed.

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Training Requirements

Only trained, authorized and qualified personnel shall be permitted to work on electrical equipment and circuitry. A qualified person is one who is trained and knowledgeable in the construction and operation of equipment, or a specific work method, and is able to recognize and avoid electrical hazards. Therefore, a person may be qualified with respect to certain equipment, but unqualified for other electrical work.

All persons permitted to work within certain critical distances (approach boundaries) of energized electrical equipment must be trained in the following:

- The skills and techniques necessary to distinguish exposed, energized parts from other parts of electrical equipment.
- The skills and techniques necessary to determine the nominal voltage of exposed, energized parts.
- The knowledge of approach distances specified in Annex A of the Electrical Safe Work Practices handbook and the corresponding voltages to which the qualified person will be exposed.
- The decision making process to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to safely perform a given task.

The UAW-Delphi Electrical Safe Work Practices training is required for all electrical workers and is one part of an overall training program to ensure all persons permitted to work energized electrical equipment meet the requirements noted above.

The UAW-Delphi ESWP training materials consist of an interactive CD program that covers the contents of the UAW-Delphi Electrical Safe Work Practices handbook, which shall be provided to each participant. Additionally, facility specific information regarding personal protective equipment, the facility's ESWP program and potential electrical hazards that may be encountered in the workplace shall be provided. The facility's Subject Matter Expert will be available to answer questions regarding the program. When the facility SME is not immediately available, a process to ensure that timely answers to questions, which arise during training, are provided, preferably in writing.

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Electrical Hazard Analysis

Each facility must perform assessments to determine the arc flash hazard potential from exposed electrical conductors or circuit parts for plant floor equipment and electrical enclosures. The degree or intensity of potential arc flash energy of exposed conductors is determined by assessing the line side of the protective devices in plant floor enclosures the characteristics of the upstream protective device.

An "Initial Survey" of plant floor equipment enclosures must be conducted as soon as possible to identify potentially "HIGH ENERGY" arc flash hazards that may exceed the protective properties of the standard level 2 FR protective clothing and other PPE provided. All plant floor electrical installations found to pose high energy arc flash hazards shall be labeled and appropriate personal protective equipment shall be provided for workers required to work on those installations as needed.

A plant floor "Enclosure To Bus Survey" which details all plant floor equipment enclosures and related conductors, circuit parts and protective devices back to the bus shall also be conducted. This survey and data collection is necessary to perform an arc flash exposure calculation for the associated plant floor equipment. Once the calculations have been completed, all electrical installations shall be labeled as to the arc flash potential and the PPE requirements for working on energized equipment.

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Roles and Responsibilities

It is the responsibility of management to direct and oversee implementation of the Electrical Safe Work Practices program. This shall be accomplished utilizing the special skills and experience of personnel involved in electrical work, plant engineering, maintenance, skilled trades and health and safety. Adequate resources shall be committed to insure that program requirements are complied with in a timely manner.

- The Plant Safety Review Board (PSRB) shall:
 - Review the program implementation on a regular basis with the Local Joint Health and Safety Committee (LJHSC).
 - Commit adequate resources to insure the proper implementation of all aspects of this program.
 - Identify one or more Subject Matter Expert(s) (SME) that will be made available to answer technical and general questions about electrical safe work practices. (Answers should generally be provided in writing.)
 - Establish an ESWP Implementation Team as required.
 - Initiates and ensures the PPE Supplier/PPE Equipment rollout process is completed.
 - Reviews the results of Electrical Hazard Analysis when completed to determine possible changes to the facility's PPE Requirements.
- Local Joint Health and Safety Committee (LJHSC) shall:
 - Ensure that all appropriate employees receive the required training.
 - Become familiar with the requirements of the Electrical Safe Work Practices program.
 - Monitor the progress of program implementation and training, and report this progress to the PSRB.
 - Include the review of electrical safe work practices during facility inspections.
 - Assist in the review of the Electrical Hazard Analysis when completed.
 - Ensure the self-audit review of any and all audit modules related to electrical safe work practices that may be developed by the UAW and Delphi.

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- First Line Supervisors of Electrical Workers shall:
 - Attend and complete the ESWP training program.
 - Become familiar with the requirements of the Electrical Safe Work Practices program.
 - Ensure that “Qualified” electrical workers are assigned to all tasks associated with electrical work.
 - Participate in the development of necessary “Safe Operating Procedures” (SOP’s) associated with electrical work.
 - Insure that all electrical workers are issued, and trained in the use of the proper protective equipment for work on energized electrical circuitry.
 - Insure that proper personal protective equipment (PPE) is worn.
- Subject Matter Experts (SME) shall:
 - Assist in the introduction rollout to all electrical workers which includes the implementation process for the facility introduction and PPE distribution.
 - Attend and complete the ESWP training program.
 - Review and become familiar with the content and requirements of the Electrical Safe Work Practices program.
 - Support local ESWP training sessions including answering questions about the training requirements and other aspects of electrical work. (Answers should generally be in writing.)
 - Report feedback on electrical issues resulting from the training sessions to the Local Joint Health and Safety Committee.
 - Participate in the development of SOPs required for work on energized electrical equipment.
 - Provide guidance and assist in conducting the facility Energy Hazard Analysis and catalog arc flash exposure potentials in the facility.

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- Electrical Workers shall:
 - Participate in the ESWP plant introduction and PPE distribution rollout training.
 - Obtain required PPE and immediately wear PPE as required.
 - Attend and complete the ESWP training program.
 - Be responsible for personal safety and be aware that each person's actions can impact the safety of others.
 - Understand and utilize all applicable safety procedures and tools during work on electrical equipment.
 - Participate in the development of SOPs required for work on energized electrical equipment.
 - Discuss safety concerns with co-workers and first line supervisors.
 - Wear appropriate proper personal protective equipment (PPE) and utilize appropriate testing equipment and tools.
 - Assist in conducting the facility Energy Hazard Analysis as required.
- ESWP Trainers shall:
 - Have experience with the computer assisted training process.
 - Complete the ESWP training program.
 - Be familiar with the Personal Protective Equipment (PPE), Tools and Instrumentation available to electrical workers locally.
 - Create a display of the above noted equipment as a training aid, with the assistance of the (SME).
 - Have the capability of contacting the designated SME, in a timely manner to resolve training questions and issues.

Implementation Guidelines

- Divisional Safety Managers
 - Divisional Safety Managers, in consultation with UAW International Representatives from the Health and Safety activity, shall develop an implementation plan for their assigned division.
 - Monitor activities in each facility to ensure implementation of ESWP.

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