The Blue Bolt

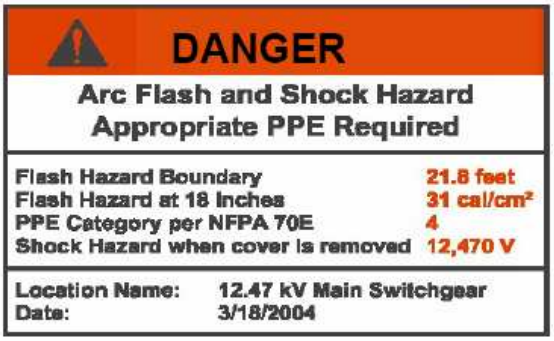
***WINTEK* Engineering Ltd.**
Winter 2006 Edition

The intention of these articles is to inspire thought, not provide a solution. All safety design should be conducted by a professional engineer.

Arc Flash Awareness and Protection

What is Arc Flash?

Arc flash is a dangerous condition associated with the release of energy caused by and electric arc. An electric arc flash can occur if a conductive object gets too close to a high-amp current source or by equipment failure (for instance, while opening or closing disconnects).



What are the Potential Hazards?

The primary hazard in an arc flash is the thermal hazard. The arc can heat the air to temperatures as high as 35,000^{O} F, and vaporize metal in the equipment. The arc flash can cause sever skin burns by direct heat exposure and by igniting clothing.

Secondary hazards include pressure hazards and auditory hazards, projectile hazards and inhalation hazards. The heating of the air and vaporization of metal creates a pressure wave (300 lb/ft^2) and can damage hearing causing sound levels to exceed 160dB resulting in possible memory loss and other injuries. Molten metal and parts are also ejected with high momentum. Inhalation of extremely hot air, molten metal and vaporized metal, as well as burning insulation smoke and fumes can do significant damage to the lungs. To be continued on page 3…..

"Check Out WINTEK's New Website"

Wintek has a new web site available for viewing. Same address as before. www.wintek-eng.com. Keep an eye out for a new phsr.com website coming in the near future.

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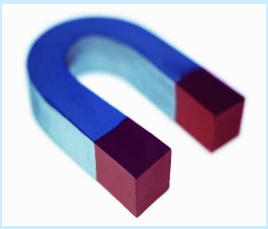
Electro-Magnetic Fields And Pacemakers

Electro-magnetic fields are produced by power lines, electrical wiring, and electrical equipment. Magnetic fields result from the flow of current through wires or electrical devices and increase in strength as the current increases. Magnetic fields are measured in units of gauss (G) or tesla (T). Most electrical equipment has to be turned on, i.e., current must be flowing, for a magnetic field to be produced.



According to the U.S. Food and Drug Administration (FDA), electromagnetic interference can affect various medical devices, including electronic cardiac pacemakers and implantable defibrillators. The occupational threshold limit values for EMF developed by the American Conference of Governmental Industrial Hygienists state that workers with cardiac pacemakers should not be exposed to a 60-Hz magnetic field greater than 1 gauss (1000 mG).

Common industrial machinery which can produce 1 guass fields include welders, magnetic conveyor and transfer systems, and any machine with a magnetic brake or powerful magnet. Welders are probably the most prevalent, and are capable of producing extremely large magnetic fields. The best way to reduce a field is to increase the distance from the EMF source. EMF strength is inversely proportional to the square of the distance from the source. PEE such as aprons or vest will not effectively shield a pacemaker from the electromagnetic energy.

If a worker has a pacemaker, there are several precautions which can be made when using a welder.

- *Limit welding current*
- *Keep welding unit and cables away from work area*
- *Ground as close to the point of welding as possible.*
- *Use dry gloves and shoes, keep work area dry*
- *Immediately stop and vacate the work area in the event of diziness.*

Workers with pacemakers or implantable defibrillators should consult their doctors and their industrial hygienists if they think their workplace contains sources of high electric or magnetic fields. Conversely, employers should ensure proper training and precautions are taken for workers that have pacemakers.

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Wintek Reachover Utility

Wintek will have a new reachover utility available on the WINTEK and PHSR websites coming soon. This program will allow you to quickly and easily calculate the required height and distance of fixed guarding from a pinch point hazard. This utility will also be made available on the general Wintek website.

What is the Current Legislation Regarding Arc Flash? *(..Continued from page 1)*

Arc Flash guidelines are currently found in several U.S. standards including NFPA 70E, NEC, IEEE and OSHA. The 2006 Canadian Electrical Code (section 2-306) states that:

> "Electrical equipment such as switchboards, panel boards, industrial control panels, meter socket enclosures, and motor control centers that are installed in other than dwelling units and are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn persons of potential electric shock and arc flash hazards."

The upcoming 2007 Ontario Electrical Safety Code (which is mandatory in Ontario) will most likely contain similar verbiage.

What Should Safety Staff Do to Protect Their Electrical Workers?

Although the safest method of dealing with arc flash is to eliminate its possibility by de-energizing equipment, it is not often possible to do so. The best solution from a procedural stand point is to create and implement an arc flash hazard program. This program should include the following:

- Assess Hazards
- Provide Documentation
- Implement a PPE Plan
- Provide Training for Workers
- Continual Improvement
- Safety Audits
- Corporate-Wide Plan

How Wintek Can Assist You?

Wintek can help you identify arc flash boundaries, flash hazard, and category of PPE required for panels in you your plant or facility. We will work with you to develop a program for your electrical workers. We can also help you lower arc flash hazard at desired points in your plant effectively lowering the danger to your employees. Contact Wintek at wintek@wintek-eng.com for more information on Arc Flash.

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ASK THE EXPERTS

Après PHSR Responsibilities

What do you do with a PHSR once you receive it? Many people may just put it in the file and forget about it thinking that their work is done.

The PHSR is an audit of the machine or process that identifies any potential safety hazards related to one or more of the Items identified in the Table in Section 7 of the OHSA. It is not a complete analysis of every component and function of the machine.

The employer must store it in an accessible location with all supporting documentation. A copy must be provided to the joint health and safety committee (or health and safety representative).

The employer must undertake to implement the measures recommended in the report before the equipment or process is operated. As the items are completed, records of the implementation process should be stored in an equipment/process file for reference and to make available for a MOL inspector.

If the measures are not undertaken, the employer must provide written notice to the joint health and safety committee (or health and safety representative) of what measures have been taken to comply with the relevant provisions of the Items identified in the Table. However, there is some risk, as if something does go wrong as a result of not following through with the PHSR measures, the employer would be liable.

Keep in mind that any change in the equipment or process made in responding to the measures in the PHSR should be reviewed by a professional engineer. Otherwise there is no guarantee that the modification will comply. Very few factories have the technical staff to engineer and implement the safety solutions required by the PHSR. Going ahead and making changes without verification by a professional engineer is risky and puts the full liability for an injured worker on the employer.

The best policy is to team up with an engineering firm that you can trust and allow them to guide you through the PHSR process from start to finish

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