# The Blue Bolt

***WINTEK* Engineering Ltd.**
**Summer 2004 Edition**


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

## *NEW SAFEGUARDING STANDARD*

The new machine safeguarding standard has finally arrived! CSA Z432-04 Safeguarding of Machinery was released in March, and is substantially longer than the previous release.

Highlights include:

- new risk assessment section (similar to robot standard CSA Z434-03)
- basic concepts and general safety considerations for design
- maintenance
- supervisory control
- training
- interlocking considerations and methods
- depth of penetration factor

.

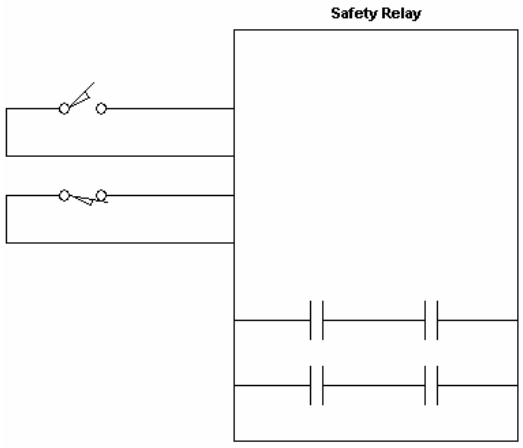
To get your copy, go to www.phsr.com, click “Downloads”, then click “CSA Z432-04”. This will take you to the appropriate location on the CSA website where you can purchase and download the standard (for $120.00 CAD).

## *USING THE <u>RIGHT</u> RELAY!*

In the world of safety circuitry, there are different types of relays that may be used. Some of our clients have expressed confusion in selection of these relays. This article will clarify the main types of relays.

### 1. Safety Relay

A safety relay is often the start of any safety circuitry. It has two input channels, and performs internal monitoring. The output contacts are control reliable if a category 4 safety relay is used.




Safety Relay Cont. on Page 3


90 Rankin St., Unit 28, Waterloo Ontario N2V 2B3
Phone (519) 884-7999 ● Fax: (519) 884-5333
wintek@wintek-eng.com

## *TRADE SHOW TIME!*

*WINTEK* Engineering will be presenting at the 2004 Southwestern Ontario Industrial Show. The show takes place:

June 2 from 9 am to 8 pm
June 3 from 9 am to 6 pm
Kitchener Memorial Auditorium

Come by and talk to our engineers! We'll be glad to discuss anything that is on your mind. Whether it's a safety problem, or an introduction to other aspects of WINTEK, we'll be happy to see you!

## *ELECTRONIC REPORTS*

All of *WINTEK* Engineering's clients can, at any time, request an electronic copy of a PHSR report, and we will provide it free of charge. It will be submitted in PDF format, but without a stamp from one of our professional engineers for liability reasons.

E-copies are becoming increasingly popular among our clients, especially those that have electronic quality systems.

Also new are serialized audit labels, which we will be affixing to all machinery that we review. We will reference this number in our report. These labels will assist plant staff in determining which machinery requires reviews, and will allow for quicker retrieval of reports.


## *CSA Z432 TRAINING*

With the new machine safeguarding standard now in effect, there will undoubtedly be many questions as to what is new and how to interpret it.

WINTEK will be presenting a series of one day seminars in the fall.

Onsite training can be arranged on request.

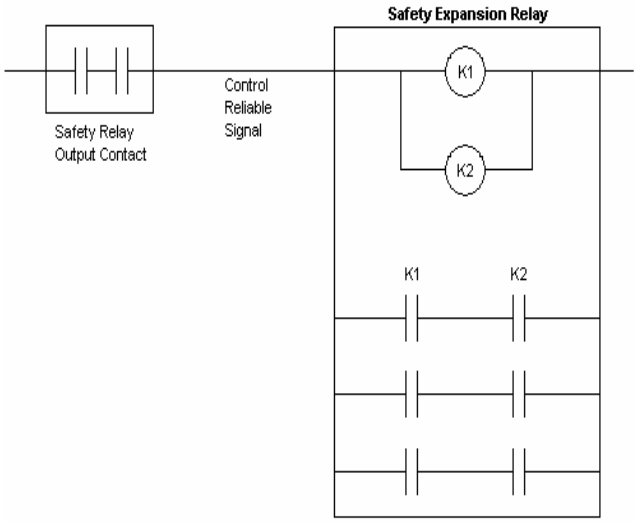
Full details are available at www.phsr.com, WINTEK's safety website.

90 Rankin St., Unit 28, Waterloo Ontario N2V 2B3
Phone (519) 884-7999 ● Fax: (519) 884-5333
wintek@wintek-eng.com

## *USING THE RIGHT RELAY!* *(Cont. from page 1)*

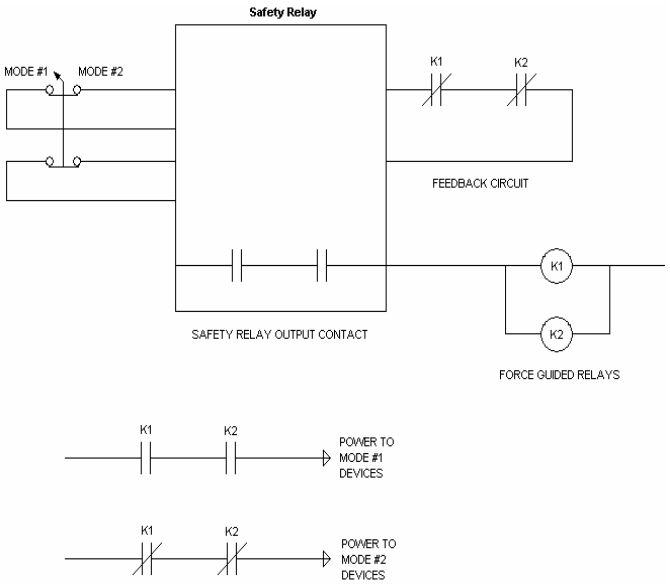
### 2. Safety Expansion Relay

Safety expansion relays are used to add additional output contacts to safety relays. They only need a single control reliable input; the redundancy is performed within the relay. A category 4 expansion relay typically adds four to eight additional control reliable contacts to the safety circuit. A safety expansion relay must always be used in conjunction with a safety relay to maintain control reliability.




### 3. Force Guided Relay

Force Guided (or positively guided) relays have contacts that are mechanically interlocked such that two contacts on that relay will not contradict each other, even in the event that the relay welds. The below example shows the two uses of force guided relays (K1 & K2). First, they are being used to expand the output contacts of the safety relay (similar to the safety expansion relay shown above). Note that two force guided relays are required in order to maintain control reliability. Secondly, the force guided relays are being used to interlock two modes of operation. This functionality could not be obtained using safety expansion relays, as they typically do not have reliable normally-closed contacts.




To determine if a relay is force guided, refer to the manufacturer's manual. Be careful with contact adder blocks, because some force guided relays don't have force guided adder blocks (Allen Bradley MB330, for example).

Also some relays will use the term "safety" when they are, in fact, simply a force guided relay (Allen Bradley 700-CF series, for example).

90 Rankin St., Unit 28, Waterloo Ontario N2V 2B3
Phone (519) 884-7999 ● Fax: (519) 884-5333
wintek@wintek-eng.com

## *ASK THE EXPERTS*

***Q: We're being forced to install weld curtains around our equipment. Are these really necessary?***

**A:** Yes, weld curtains are very necessary! Exposure to the ultraviolet rays produced during welding can cause painful damage to the eye.

Ultraviolet keratitis (actinic keratitis, arc eye, welder's keratitis) occurs when the cornea, the transparent section of tissue at the front of your eye, is burned by ultraviolet radiation. This results in damage similar to sunburn, but it is much more painful! There are no symptoms until about 6 to 12 hours after the initial exposure, and then the eye begins to hurt and throb. The eye may become involuntarily watery and the eyelid may clench shut. Also, the person is likely to be extremely sensitive to light.

An optometrist or ophthalmologist will be able to ease these symptoms for the patient and full recovery is expected in 24 to 48 hours. Further complications are rare although permanent, sight-threatening injuries may occur. Contact lens wearers should not wear contact lenses again until cleared to do so by an optometrist or ophthalmologist.

---

***Q: So why do we need weld curtains, since all of our welders wear eye protection?***

**A:** Ultraviolet damage to the cornea can occur in a fraction of a second. In fact, one of the most common scenarios for welder's keratitis is when the welder lights his or her torch with the welder's mask up and then flips it down after the torch is lit. Damage occurs so quickly that if the worker was blinking during exposure, a well-defined line can be seen separating the normal from the damaged cornea.

Long term exposure to UV radiation has been shown to produce cataracts in some people and weld shields help to reduce this exposure as much as possible. As you can see, weld shields will help prevent accidental UV exposure and damage in unprotected workers nearby the welding area.

*If you have a question you would like to see answered in a future "Ask the Experts" column, email us at wintek@wintek-eng.com. We can't wait to hear from you!*

---

Visit *WINTEK* at www.phsr.com for more helpful hints and informative articles about PHSR's. You will also find links to various standards and other safety related downloads. We can also answer your specific questions regarding PHSR's in individual situations.
Our main website, www.wintek-eng.com, gives more detailed information regarding *WINTEK*'s services and various accomplishments.

90 Rankin St., Unit 28, Waterloo Ontario N2V 2B3
Phone (519) 884-7999 ● Fax: (519) 884-5333
wintek@wintek-eng.com