Remote Lockout/Tagout

DOE Accelerator Safety Workshop

August 7-9, 2007

Introduction

- **Proper execution of lockout/ tagout (LO/TO) of hazardous energy sources is of vital importance to safe operation at DOE facilities**
- **Proper execution of LO/TO can result in many issues:**
  - **PPE**
  - **Proper test equipment**
  - **Procedure**
  - **Training/ Qualification**
  - **Significant time to lock and unlock equipment**
  - **Required to use craft workers, not always available**

Remote LO/TO

- **One device on the market holds the promise of greatly simplifying electrical LO/TO**
- **The Allen Bradley Electroguard product allows a worker to shut off power by the operation of one switch without verification**
  - ***"But does this meet OSHA requirements?"***

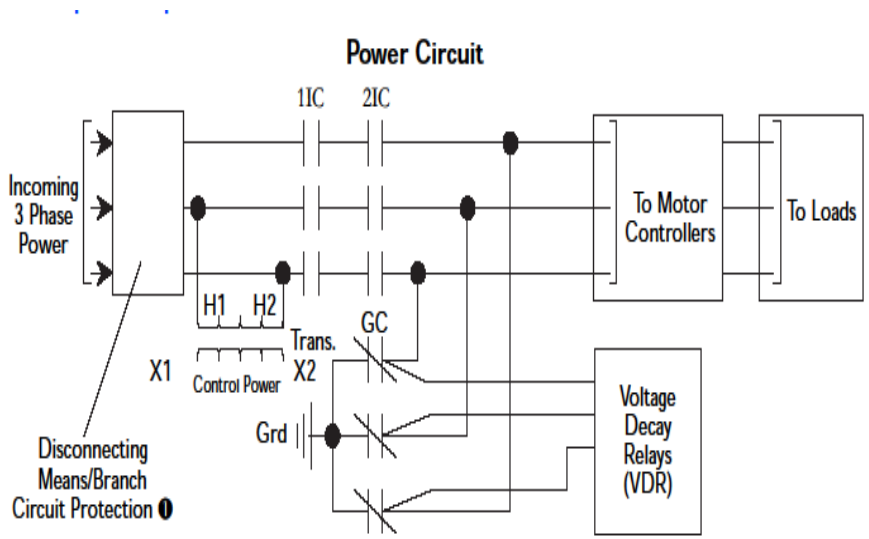
Stay Tuned!

Electroguard Design

- **A complex system composed of:**
  - **Safety Contactors**
  - **Safety Relays**
  - **PLC base I/O for communications**
- **Designed to EN 954-1, category 4, certified by TUV**
- **To perform power isolation, worker turns switch and *if green light illuminates*, then applies lock. Equipment is now de-energized and locked out**
- **Can be interfaced with other control equipment (i.e. remote actuation, holdoff)**

Electroguard Design

- **"Double block and bleed" design**
  - **Two contactors in series between line and load and one contactor to ground the load**



Comparison

- **Normal LO/TO**
  - **PPE required**
  - **Proper test equipment required**
  - **Procedure may be required**
  - **Training/ Qualification required**
  - **Significant time to lock and unlock equipment**
  - **Required to use craft workers, not always available**

- **Remote LO/TO**
  - **No PPE**
  - **No test equipment**
  - **No procedure**
  - **Less training**
  - **Minimum time to lock/ unlock**
  - **Can be performed by trained workers**
  - ***System must be periodically tested however***

EN 954-1 Machinery Safety/ Control vs. IEC 61508

- **Machinery safety**
- **Less complex**
- **Well defined/ limited functions**
- **Behavior of components well understood**
- **Prescriptive (cat 4- no single faults, diagnostic coverage**

- **Process safety**
- **More complex**
- **Particular safety functions not defined**
- **Involves use of more complex (PES) components**
- **Performance based (SIL 2)**

Replacement for EN 954-1: standard EN ISO 13849-1 is ratified!

- **A significant revision in the standard that's now appeared as EN ISO 13849-1 is the probabilistic approach to the assessment of safety-related control systems**
- **Will allow use of standard components with known performance levels; formula used to calculate performance level (PL_r)**

I'm from the Government....

- **Last February OSHA responded to a letter from AB:**
  - **Does the Electroguard… meet the energy isolating device definition contained in 1910.147(b)?**
    - ***No… circuit control devices cannot be used to control hazardous energy***
  - **If used (properly) would the Electroguard (be suitable for) the LOTO standard's minor servicing exception?**
    - ***Yes… on a case by case basis***

Now What?

- **AB intends to apply for a permanent variance from OSHA to allow the EG product to be used for LO/TO**
- **With this variance as a model, a company can apply for their own permanent variance (one per company, not one per site)**
- **In time (years), the regulations may change to recognize approved control devices for LO/TO**
- **Meanwhile companies can:**
  - **Use the device for "minor servicing"**
  - **Use the device for LO/TO anyway**

Questions for Attendees

- **Would this product or equivalent be useful at BES facilities?**
- **What requirements could be agreed on (i.e. category, SIL, PL_r ,formal analysis/ certification requirements etc.) for this product or for an in-house system?**
- **Would we pursue a variance from DOE to allow the use of this (or similar) design?**