Additional Safety Features

August 3, 1998

There are several optional features that our clients specify to enhance the overall safety of the switchgear for the individual electrical technician. This PTB will begin a series highlighting some of these features so that others might benefit from the collective experience.

Three of these topics that were discussed at the last PCIC Safety Workshop were:

**Shutter labels:**
The simplest enhancements to add to a switchgear line-up are shutter labels. The shutter label indicates to the technician performing testing or grounding on a vertical section the destination of the top and bottom stabs. The shutter is the moveable guard that drops in front of the breaker stabs as the breaker is racked to the disconnected position. The labels are decals mounted on the shutters in front of the circuit breaker stabs. The labels identify whether the stabs are "Load Side", "Line Side" "Bus Side A" or "Bus Side B".

Tasks often require an electrical technician to open the shutters on an energized cell. Whether the shutters need to be opened to megger a motor feeder or to insert a ground and test device it is important that the technician be given visual confirmation of which set of stabs are energized. Yes, the safe-work practice requires that the stabs be checked for voltage prior to hooking up the test equipment. But, this simple label offers a valuable confirmation to the technician in the field that has proven to be effective.

**Shutter locks:**
The shutter mechanism is the last level of protection between the stabs and a person doing work in the cell. By padlocking the shutter closed you protect technicians from mistakenly opening a shutter on an energized set of stabs. Our existing shutter mechanisms have a set of holes to allow the shutters to be padlocked in the closed position. We also have an optional design that brings a bar from the shutter mechanism to the very front of the cell. This extension design allows the shutter to be the primary point of Lock and Tag out.

Once again this is something that is covered by the plant’s safe-work practices. Every safe-work practice says assume everything is energized before you touch a conductor. But we have had another case here in the Gulf Coast region just recently of an individual getting electrocuted on an energized stab while doing preventative maintenance. The lead technician was performing preventative maintenance on a secondary selective system. He had performed the proper isolation and lock out procedure. As planned, he had left a load side CPT energized via a down stream emergency generator to provide station service power for the shut down. The technician was going down the line up cleaning all the breaker stabs when he mistakenly went into the cubicle with the load side stabs energized and was killed when he came in contact with the stabs.
Because of other work going on, the group required access to the cubicle so they had to be able to leave the cubicle door unlocked. A simple lock and tag on that particular set of shutters would have prevented the technician’s mistake. There is a pair of 3/8” holes through the moving and fixed portion of the shutter mechanism that permit the locking of the shutter. This locking mechanism also proves to be useful with any main-tie-main system. The shutter lock is the best system available for protecting people when the switchgear has a tie cubicle and half of the system is out of service for maintenance. The shutter lock is also a very effective point for locking out the breaker and cell.

**Cell locks:**
The most discussed topic when drafting a site Lock-out and Tag-out Procedure is where to place the locks on metal-clad switchgear. Locking out the cell is replacing locking out the circuit breaker due to the increased safety. Locking out the cell assures that a spare breaker cannot be racked in and mistakenly energize downstream loads. A cell lock allows full access to the breaker out of the cell on the floor for maintenance purposes while people continue to work under their lock-out and tag-out on downstream loads. The cell lock absolutely prevents any breaker from being racked onto the stabs.

In all cases the shutter labels, shutter locks, and cell locks can play an important part in how the switchgear is operated. Every site has different skill levels and site procedures that determine when and if these features should be incorporated into the site safety program.

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