

## **Subject:** Metal Enclosed “Load Interrupter” Switch Replacement

**G&W Products:** PNI style switches

**Issue:** A prominent Southern California university had an extensive underground distribution system that was originally built in the 1960s. Loadbreak switching and overcurrent protection were performed using air insulated, metal enclosed, Load Interrupter, or “LI” switches. Over a relatively short period of time, the equipment’s performance would degrade, due to exposure to moisture and contaminants from irrigation, condensation, and their proximity to the Pacific Ocean.

The university wanted to find a replacement that was immune to the effects of the environment, with a maintenance free design that offered the operations personnel improved safety. The fusing that provided the overcurrent protection did not give them the coordination flexibility they wanted, and over time the costs of the replacement fuses added up. Because their equipment rooms and pads were all in place, they wanted a solution that would fit in these spaces without modification. They also wanted a design that in the future could be a part of an automated Smart Grid style self-healing distribution system.

**Solution:** After a thorough investigation of their options, the university selected G&W’s PNI style deadfront, maintenance free, SF6 gas insulated switches, with resettable vacuum interrupters for overcurrent protection. While the problems associated with the metal enclosed fused LI switches had always been tolerated and worked around by the university’s operations personnel, the G&W PNI switches eliminated all of these shortcomings.

The mechanism used for loadbreak switching in the PNI has been tested to 1,200 loadbreaks of 600 amps with absolutely no maintenance, so it will provide the university with safe and reliable switching for many years to come. Consequently, it is an ideal choice for automatic transfer and distribution automation schemes. Also, when in the open position, the switch provides a visible disconnect to safely isolate a section of cable from line voltage.

The fault interrupting mechanism of the PNI provides substantial advantages over the fusing of the LI switch design. Unlike the LI switch, the PNI makes use of vacuum interrupter mechanisms that combine vacuum bottles and electronic controls to clear faults with a wide variety of time-current characteristic curves to better protect the downstream distribution system. The resettable vacuum interrupter means that replacing fuses are a thing of the past. In addition, they provide three phase trip, thereby preventing single phasing conditions common to fusing. The vacuum interrupter is rated to clear faults up to 40kA asym., and can handle up to 600 amps of continuous current.

Due to the proximity of the university to the Pacific Ocean, the G&W PNI switches are an ideal solution, as they are



▲ *PNI style deadfront switch.*

deadfront, with all live parts completely isolated from the outside environment, providing maximum protection from the detrimental effects of the coastal air. Their maintenance free design is a perfect match for the application, as the university’s continuous operations offer no opportunities for any scheduled maintenance outages. And unlike LI switches, no high maintenance, energy wasting space heaters are required. The G&W PNI switches are always ready when called upon to switch loads and interrupt faults.

The PNI switches are configured specifically to fit in the spaces formerly designed for the LI switches. In most cases the existing cables and conduits can be reused, greatly minimizing replacement costs.

**Solution Results:** The university chose the G&W solution for numerous reasons. G&W switches are time proven products, known throughout the industry for their unmatched reliability, that the university knew they could count on to provide reliable power throughout their campus. The switch designs allowed for easy and economical replacement of the aging LI switches. The university’s operations personnel no longer have to deal with replacing fuses within unsafe equipment that has degraded due to the effects of the environment and insufficient or deferred maintenance. All of this contributed to the university personnel’s satisfaction with the completed installation. As a result, the university is already thinking about an automated Smart Grid system, with the G&W PNI switches as the backbone.

**For more information:** Contact your G&W representative or visit [www.gwelec.com](http://www.gwelec.com).