

EMERGENCY “DON’T” STOPS Providing Compliant Disconnects for Fueling Dispensers

The concern is that current installation details from the dispenser manufacturers do not depict the installation of these disconnects. The manufacturers rely on the installers to be familiar with the applicable codes. The installers rely on the installation documents. So the installation of an Emergency Stop and Service Disconnect system has fallen between the cracks of the manufacturers and the contractors.

The result is most stations built to date are constructed with an Emergency “Don’t” Stop Disconnect system.

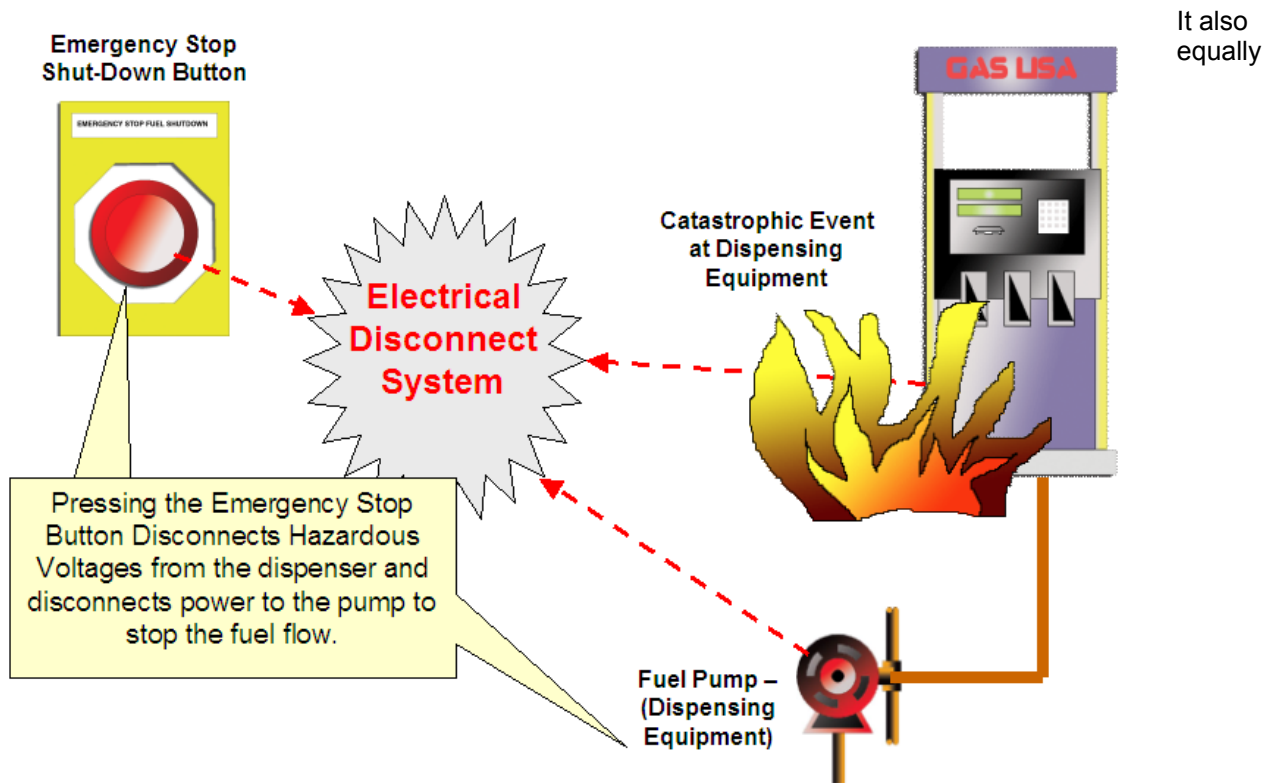


The “EMERGENCY STOP” found at a gas station is there as Safety device installed to safeguard persons and property against the potential of an ignition hazard.

Ever wondered what happens if the “Emergency Stop” button was pressed? How do you know that it performs the safety operations that it is supposed to?

The “Emergency Stop” is part of an electrical disconnect system that is designed to isolate hazardous voltages that can be the source of ignition. Hazardous voltages come from circuits such as power for the dispenser, dispenser data communication and credit card data circuits. Regardless of the voltage either high or low voltage these voltages all pose a risk of causing the ignition of flammable vapors. The proper removal of these voltages is very important when safeguarding persons and property when a critical situation occurs.

Figure 1: Expected Effect of a Fueling Dispenser Emergency Stop and Disconnect System



important that these voltages are also removed to eliminate risk of ignition and the potential for an electrical shock when service person works on a fuel dispenser or other equipment. The means for removing the voltages for servicing can be part of the same “Emergency Stop” electrical disconnect system.

While equipment such as dispensers seem to have become more sophisticated, the systems backbone and structure has changed very little. Systems installed today are done very much in the same way as they were 20 years ago. This is evident when inspecting a variety of installations that were constructed over a period of time and with different combinations of equipment. The problems and violations you find are consistent.

The problem?

While sites may have an emergency stop button the system that controls does not meet the current safety requirements defined in national safety codes such as the “National Electrical Code®” even though these codes have been adopted by most local state, county and municipal governments as a recognized minimum safety code.

The NFPA codes do not impose different requirements for low voltage data circuits from AC power circuits therefore a circuit of any voltage must meet the requirements of circuit disconnects.

Figure 2. is an example of the typical system that has been installed for years. This system does not comply with the requirements of adopted NFPA (National Fire Protection Association) codes.

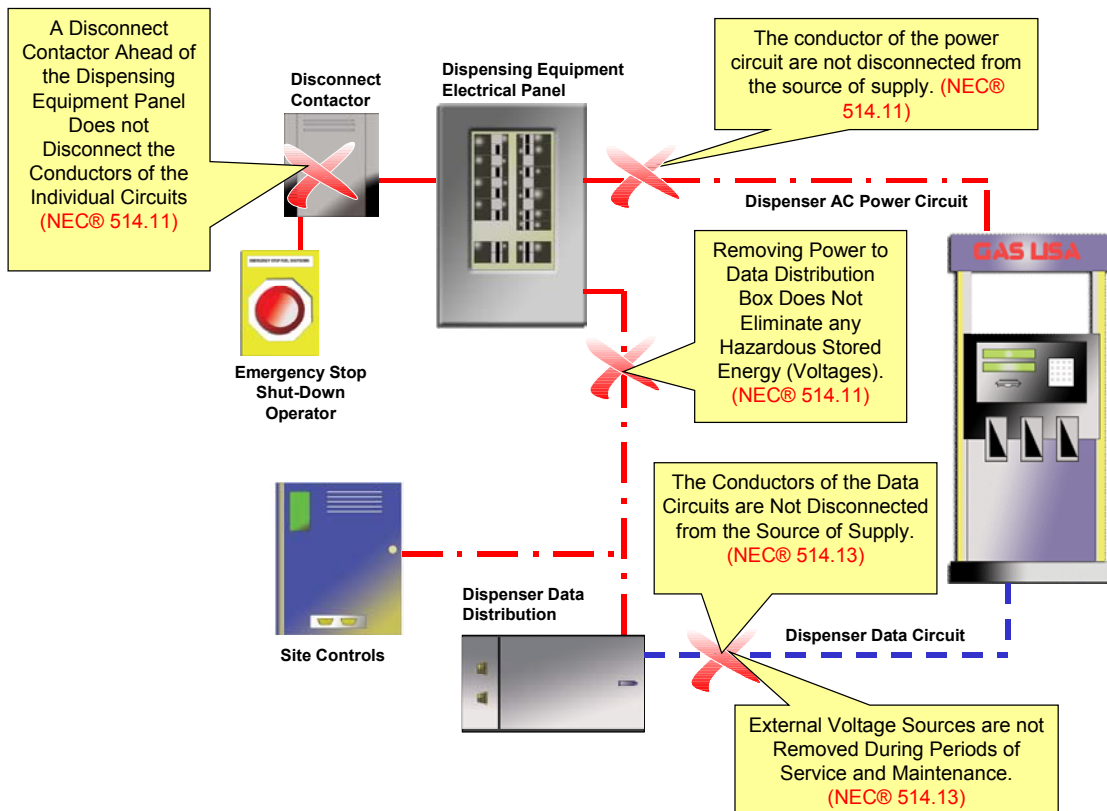


Figure 2: A Typical Non-Compliant, Commonly Installed Emergency Stop System

When analyzing the system it is important that you consider the requirements for both the emergency stop or circuit disconnects and the requirements for periods of service and maintenance specified in the NFPA codes. Failing to meet these requirements means that an adequate effort to provide required safeguards has not been met.

Depicted in the illustration the voltage disconnect system is based on the premise that a single disconnect or contactor installed ahead of the electrical panel powering the dispensing equipment meets the requirements of the adopted codes. This is incorrect as this system falls short of meeting the requirements of the NFPA codes.

A single contactor connected before the dispenser equipment panel may remove AC power from the dispensing equipment but it does not meet the requirements of disconnecting the conductors of the circuits leading to the dispensing equipment. By disconnecting the AC power conductors leading to the dispensing equipment total isolation from faults in the system is provided.

In order to accomplish what is required circuit disconnect controls have been added to the conductors of the circuits leading to the dispensing equipment. Figure 3 shows a compliant Emergency Stop and Disconnect system. In this system AC power controls are installed in the individual circuit conductors. Also in order to provide the required separation of the potential energy of the data circuits, circuit disconnects for the conductors of these circuits has been provided.

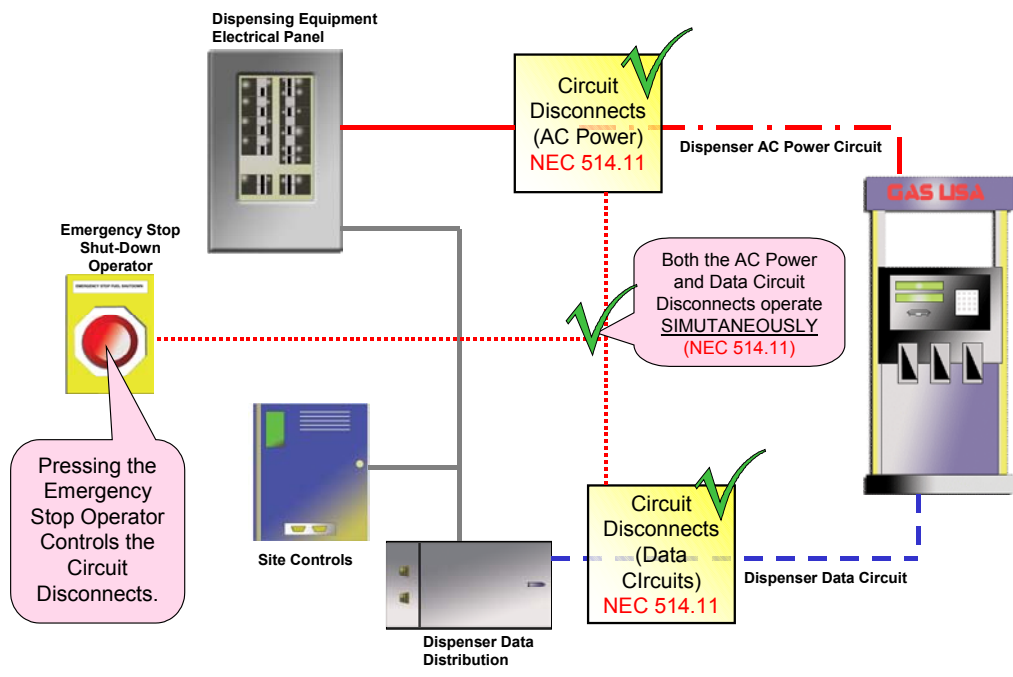


Figure 3: A Properly Engineered Emergency Stop and Disconnect System for Fueling Dispensers

In order to meet the NFPA code requirements of provisions for service and maintenance of dispensing equipment provisions for disconnecting both the AC power and low voltage circuits is to be provided. As shown in Figure <num>, "Title" this has been accomplished by utilizing the some voltage disconnects as required to meet the NFPA circuit disconnects. By the allowing for individual control of the disconnects that separate the data circuit conductors and the use of various other points of disconnect and controls a service technician can properly isolate external voltages from the piece of dispensing equipment that is being serviced eliminate the possibility of hazardous voltage igniting fuel vapors or causing an electrical shock.

Applying what has been discussed requirements for emergency stop operation as well as periods of service and maintenance must be addressed during the design and installation of petroleum fuel dispensing system. It is important to note that an in-depth understanding of national and local adopted codes is a must have in addition to any equipment manufactures installation instructions.

While equipment such as dispensers seem to have become more sophisticated, the systems backbone and structure has changed very little. Power Integrity Corporation provides engineered Fueling Dispenser Emergency Stop and Dispenser Wiring Disconnect System that are compatible with today's dispensers and equipment

