World Cement talks to Allan Clark, Manager of the Eaton Experience Center, about the importance of training in hazardous locations.

World Cement (WC): What are some of the hazards within the cement industry and why is training crucial?

Allan Clark (AC): One of the most important aspects of working within hazardous locations or explosive atmospheres is the foundational knowledge of what could create a catastrophic event or explosion. Explosions exist when there is the presence of a combustible material, heat or electrical arc, and oxygen – also known as the fire triangle. When the correct concentrations are present, an explosion could be initiated by even simple static electricity or a hot surface near a kiln.
The common misperception is that the materials that are utilised within a process area are non-flammable. Although the assumption is correct for the end product, explosive atmospheres still exist within the process of the raw materials.

Within the quarrying, drying and grinding, kiln heating, and packaging or storage, cement manufacturing has multiple steps within the process that release fine powder and dust within the environment. Because of the multi-stage process, cement manufacturing yields potential for both primary and a secondary explosive atmosphere. The primary hazardous condition exists directly around machinery that may release fine particles and dust within a general area – also called a dust cloud. In the event this cloud becomes explosive due to the fire triangle, a secondary explosive atmosphere could exist. The secondary explosion takes place due to the release or movement of settled dust material that is on the ground or around machinery. Once the settled material is dispersed in the air, the initial explosion uses the new material as fuel, causing a compounding explosive pressure within the environment. Secondary dust is common around electrical machinery, conveyor belts, facility walls, and/or roofs.

**WC:** What are some types of the biggest training challenges for hazardous locations?

**AC:** For in-depth hazardous area training, Eaton uses a three pillar model that integrates classroom setting for theoretical content delivery, hands-on laboratories that allow customers to immerse themselves into technical design, installation practices and troubleshooting scenarios, and interactive application environments that enable advanced technical competency through simulated applications. Within the combination of these three pillars, individuals increase situational awareness and competency. These approaches to training enable true competency development, aligning to the challenges that cement manufacturing professionals face every day. Additionally, Eaton training focuses on global codes and standards, as well as industry association best practices, ensuring its comprehensive technical content is applicable no matter the location of the cement process. The primary goal and focus of all training programmes is to simplify design and installations, mitigate common challenges, and increase and protect personnel that interact with electrical systems.

**WC:** What are some of the common misconceptions in hazardous area training?

**AC:** There are a multitude of challenges presented within a harsh and/or hazardous environment. Perhaps the most important is to understand and recognise the hazard, ensuring that work plans include consideration of the presence of combustible material. The primary concern is maintaining safety.

**WC:** What are the advantages of hands-on training?

**AC:** Proper training and certification can significantly reduce the potential for catastrophic events, helping to keep everyone involved in hazardous area design, installation, maintenance, and management safe.

By providing online training programmes, along with specialised training in technology centres, Eaton helps both present and future engineers gather knowledge to meet design and application needs to ensure electrical workplace safety. Education is crucial to develop in-depth problem solving skills, expand experience, enhance workplace efficiency, and gain valuable material handling knowledge.

Our training programmes vary from inspections and installation practices to maintenance and inspection of specialised equipment designed for hazardous environments, such as process control, power distribution, and life safety equipment.

One aspect of training that is often overlooked is the difficulty of gaining onsite access to operational equipment for hands-on training. Through Eaton’s experience in working with a wide range of companies across multiple markets, we have seen a growing need for personnel to access real products first-hand within a safe, controlled learning environment that mimics energised applications. Live application training offers hands-on training in true-to-life environments. Learning techniques for real-world maintenance and troubleshooting of electrical systems is an advantage for all levels of the workforce, benefitting those beginning their careers in the industry, allowing them to see and touch real products before entering the plant environment, as well as offering those currently in the workforce with a desire to expand their capabilities the opportunity for advancement within the business, staying up to date on new technologies within the industry.

**WC:** What classes does Eaton offer for hazardous training?

**AC:** Eaton understands the challenges within hazardous areas. Eaton’s Experience Centers, located in Pittsburgh, Houston, and Atlanta in the US, as well as Australia, Singapore, South Korea, and Saudi Arabia, offer a wide range of training courses for industry codes and standards, products, and solutions for the cement industry, along with a variety of other markets. The Experience Centers offer customers the unique ability to experience
hands-on training in a true application environment, supporting both electrical workplace safety and sustainable competency development for the cement industry.

By using the Eaton Experience Centers, field operators can learn in a safe environment to better understand the challenges associated with hazardous areas and the available solutions. Course attendees can also utilise Eaton’s Experience Centers to learn about recent changes in codes and standards, along with best practices with hands-on and application training. Eaton also incorporates CompEx (competency in hazardous environments) industrial hands-on laboratories that allow customers to gain an industry regulated five-year license, demonstrating competency and experience handling processes within the hazardous system.

The components of available training modules include the following:

- Mitigation of risk, protecting people and assets.
- Downtime reduction, from understanding inspections in hazardous explosive environments to downtime and production halts.
- Compliance with best practices that align with both conventional and new technology.
- Regulatory compliance: expert instructors who have worked in explosive environments.

Training courses include the following, as well as other, topics:

- Industrial power systems analysis.
- Power quality monitoring.
- Motor control and protection.
- Hazardous area design and inspection best practices.

Eaton also has the capabilities to hold remote foundational training classes that set the stage for hazardous location training directly inside a customer’s facility. These remote classes focus on key concepts, safety requirements, and hands-on training. Eaton also offers multiple mobile training vehicles to visit remote destinations, as well as offering online tools, blogs, videos – all focused on providing expertise anytime and anywhere.