African Mining Brief
Africa's Leading Mining Journal

Taming costly spikes & transients

(http://ambriefonline.com/wp-content/uploads/2015/08/Sinetamer.jpg)

The common surge protection management approach in African mines ignores the effect of transient voltage spikes on equipment performance. Fortunately, there is an effective way to manage this challenge, Jeff Edwards, the Texas-based President of Energy Control Systems, tells *African Mining Brief*.

It may be difficult to quantify just how much the "old school" approach to contemporary voltage spike challenges costs power-intensive industries like mines. But the popular view is that it is exorbitant.

Typically, the engineering team develops a false sense of security by assuming that they have tamed the problem once and for all by focusing on external exposure to high surges, while ignoring the "minor" ones that build up within and snowball into costly downtime later.

Transient voltage spikes

Industry wide, the most important point missed in maintenance programmes is that one of the most widespread causes of software confusion, system lock ups, resets and unexplained microprocessor based board & equipment failures, outside of lightning strikes within all types of systems happens to be transient voltage spikes, says Jeff Edwards, the Texas-based President of Energy Control Systems (ECS), in an interview with ***African Mining Brief***.

"In a typical facility, the level of exposure to transient spikes ranges from 500 volts to over 6000 volts.

"What is more, the frequency of transient events in most industrial sites is in excess of one million per hour due to proliferation of Variable Frequency Drives & other high frequency equipment on production floors," he says.

Costly downtime

Usually, it is when least expected that a facility malfunctions, a situation which proves difficult to contain. Edwards singles out four main downtime costs: lost production, product damage, lost revenue, equipment damage and unplanned maintenance.

"As a result of any interruption to production, a business loses the margin on the product that is not produced and sold. In addition, interruptions can damage a partially complete product, causing a product rerun or scrapping.

"Downtime for data centres and call centres can potentially escalate into hundreds of thousands of dollars per hour in downtime. Furthermore, reacting to a voltage disturbance can

involve restoring data backups, halting production, diagnosing and correcting the problem, clean up and repair, disposing of damaged products and, in some cases, environmental costs," Edwards explains.

The cost of transient spikes to African mines may well run into billions, considering that the "standard" response is to throw money at the problem. And the picture could have been different were a proactive preventative maintenance approach widely applied.

"Original Equipment Manufacturers (OEM) are profiting exorbitantly from supplying spare parts because of the ignorance of mines whose well-read engineers have not learnt that it is important to isolate microprocessor based equipment from the harsh electrical power fluctuations," laments Edwards. He points out the common oversight is the assumption that once the external threat of lightning strikes and surges are contained, there is no need to worry about the damage to internal equipment like microprocessors.

Preventative maintenance

Isolating microprocessor based equipment from the harsh electrical system power fluctuations is always beneficial and often a critically important investment. And this can be done through preventative maintenance, which can ascertain when/if a chip is going to fail or 'mis-process" or when electronic ballast is going to die, says Edwards.

"In fact, it is critical to understand and communicate that it is not what has occurred external to the facility with the utility company that negatively impacts on productivity and profitability."

To some degree, industry's oversight might be understandable. Thus far, there is no scientifically proven device that, as Edwards notes, "can insulate, isolate and deliver the sinewave demanded by the microprocessors commonly used these days".

The main challenge that the industry faces these days as regards isolating low voltage is that a usual suppressor is programmed to respond to an over-voltage sine wave event within the range of 15-25%, Edwards points out. And it is only after that it will start the process of removing the surge event.

"On the other hand, there is a level of voltage that goes the suppressor unit cannot pick and suppress, and this let through voltage, is what causes a crisis later."

Sine wave and frequency simultaneously monitored

Edwards dismisses the myth that there is a component which can actively track a sine wave. "That's virtually impossible," he says.

Fortunately, it is possible to react to frequency and voltage changes simultaneously with SineTamer products, through a circuit which operate independent of the voltage and as such have no "clamping voltage levels".

Edwards explains: "This reacts to frequency and voltage changes simultaneously. When the sine wave becomes 'distorted' due to a surge, in effect the frequency of the sine wave has changed. It is at that point of change that suppression begins to occur.

"The level at which the surge is eliminated from the system by the SineTamer is largely dependent on the type, duration and strength of the transient.

Industry endorsement

SineTamer is progressively being adapted by forward thinking mine managers in Africa, who are fascinated by the cost savings that it brings. Though OEMs are obviously concerned that their replacement parts business might be affected as equipment downtime cases will be drastically reduced, they do not need to worry. Sine Tamer ensures that machines are well-protected from damaging spikes and transients. .