For a number of years now, unexpected electricity outages have been a reality in South Africa. Load shedding, cable theft and other technical problems not only interrupt the flow of production, but leave huge losses of both time and money in their wake.

Anton Eberhard, a business school professor at the University of Cape Town and an energy expert, says in an age where the functioning of business is inconceivable in the absence of electrical power, even a brief power outage can cause tremendous losses of productivity, material and revenues, as well as compromise food safety.

He explains that the degree of impact caused by a power failure to an individual company varies by industry and the nature of applications. “It can range from being disruptive to life threatening, and therefore a reliable and adequate source of electric power is necessary for the provision of water, energy, security, heat for preservation of critical industrial machinery and the integrity of food products,” he adds.

Power outages bring production lines to an abrupt halt, which potentially translates into losses of material, breakdown of machinery and a definite loss of productive time. It may also cause supply chains to shut down altogether.
“Food processing plants rely heavily on the uninterrupted availability of power for the manufacture, storage and preservation of perishables that have extremely limited life spans.

“Power outages can cause in-process products worth several millions of rands to be discarded due to damage or the risk of spoilage. This may also require a sizeable amount of money to be spent cleaning the lines and storage tanks,” adds Anton.

Emergency power systems
An emergency power system is any form of independent power generation equipment that is required to feed equipment or systems whose failure may present a safety hazard to persons or property, explains Anton.

“A standby power system refers to an independent power system that allows operation of a facility in the event of a power failure. The benefits of investments made in necessary power backup arrangements far outweigh the shocking costs related to irreparable damages and irretrievable loss of revenues caused by downtimes,” he says.

Preparedness on the part of business for long power outages is very important. Mostly companies might not think that they may have a long power outage, but when preparing for a long power outage a company must consider buying a back-up generator or put in place other measures such as investing in renewable energy.

“Installing solar panels and also considering biogas energy or methane gas can be an option,” Anton says.

Food safety is a key factor in the food and beverage industry as a whole and requires both reliable power and hot water to clean the lines and prepare for start-up after even short power outages.

Business interruption
Food and beverage processing is an energy intensive industry, says Edward Chabane, country representative of Diesel Services and Supply, suppliers of commercial and industrial generator sets.

“If power is lost, milk congeals within three to five minutes and the plant could be down for two hours, which means that the product in entire pipelines may have to be discarded.”

He says it is equally important for food and beverage processors to have reliable power to stay online during power grid blackouts and even momentary power sags. “Power outages can be very expensive, for example, in milk processing, milk is piped over long distances. If power is lost, milk congeals within three to five minutes and the plant could be down for two hours, which means that the product in entire pipelines may have to be discarded.”

Back-up generators work very well for long power outages and can kick into action automatically when the grid supply fails.

When power is lost for any reason, pumps stop pumping, compressors stop running, stirrers quit mixing, lights go out, and instruments and controls may malfunction.

“These equipment outages may lead to tank overflows, runaway chemical reactions, temperature or pressure increases or decreases, all of which could lead to a spill, explosion or fire. Even if there is no immediate release, there may be a delayed reaction caused by thermal shock or other factors that can compromise equipment integrity during subsequent operation,” Edward explains. When power is restored even after a brief interruption, some equipment may automatically restart.
before process operations are ready, while others may need to be reset and restarted manually.

Edward says large facilities often have multiple power systems, with some that can tolerate small outages and others that are highly protected for IT servers. A comprehensive emergency plan that has been communicated and tested with a company’s personnel will help minimise losses during a power outage. “Putting in place measures meant to arrest power outages underscores the importance of having power protection in any kind of industrial facility where power interruptions can result in unsafe conditions or a significant loss of material being processed,” he says.

**Economic impact**

The electricity crisis in 2010/11 cost South Africa R120 billion in a single year, or about 5% of GDP, according to Free Market Foundation executive director, Leon Louw.

He says the cumulative loss was about one percent of economic growth, with commensurate losses in employment and development.

“Another energy crisis would be calamitous and companies have to be prepared for these eventualities.”

Leon believes the reason for the recent crisis, which culminated in early 2008 with the near collapse of the national grid, is failure to make the electricity market more dynamic and competitive.

The peak forecast for 2011 is about 37 500MW, which is a 2% increase on the 2010 peak demand and has also caused many blackouts.

**Human impact**

In addition to causing inconvenience and financial losses, power outages can endanger the safety of employees and the public at large.

People trapped in buildings with automated access control systems, elevators that come to a sudden halt and are plunged into darkness, fire alarms and water sprinklers that cease to function and the inability to communicate via phone or e-mail with emergency services are just a few examples of power outages becoming more than just a nuisance factor and threatening to endanger the safety and lives of millions of people simultaneously.

Failure on the part of any processor to recover from a power outage according to best practice and ensure that the integrity of the plant lines and resulting product remains intact, could also lead to serious health risks for consumers who are unfortunate enough to buy the compromised end product. M&J