

ARTICLE

Power protection for one of the world's largest vehicle manufacturers



Toyota is the second largest automotive manufacturer in the world, with over 330,000 employees manufacturing 10 million vehicles each year. Its operations in Thailand were established in 1979 and the automotive giant now has three assembly sites in country. The Samrong plant manufactures around 1,000 units each day and the 5,000 employees produce 230,000 units annually with a primary focus on the brand's Hilux utility model. Such a large production yield requires significant reliable power resources.

Power disruptions

The country's tropical weather systems have a considerable effect upon the electrical grid infrastructure and, during the rainy season which lasts from June to October each year, sags, swells and complete power outages are common occurrences. During the last five monsoon cycles, the Samrong plant has experienced 29 power quality events from the grid, which has resulted in a loss of 76 car bodies from the painting process area of the site.

These power disruptions cause sensitive equipment such as programmable logic controllers (PLCs), motors and conveyors to stop completely, which can take up to 30 minutes to reset and get up and running again. This can result in the loss of up to 16 units each time the plant experiences a power quality event.

Toyota needed a high performance, high efficiency uninterruptible power supply to protect the plant from utility events and enable continuous power supply to their industrial processes. Mr. Narudom Jaroenpanich of Toyota's Samrong plant explains, "We approached U-Industrial Tech Co Ltd, ABB's partner in Thailand, to supply an industrial-grade UPS together with a full installation, commissioning and service package. On 19 April 2015, ABB's PCS100 UPS-I was installed on the plant's rustproofing and coating process line, protecting the 1500 kVA load for up to 30 seconds in the event of a power outage."

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01 ABB's UPS-I in situ at Toyota's Samrong plant. The unit protects a load of up to 1500 kVA for up to 30 seconds in the event of a power outage.

An uninterrupted power supply

To supply continuous power during utility events the PCS100 UPS-I incorporates a modular energy storage and inverter system that can deliver autonomy up to several minutes. The PCS100 UPS-I uses a robust high speed power electronic disconnect switch to interface from the utility to the load. When the utility voltage is within an acceptable range, the load is supplied directly by the utility. If a sag, surge or outage occurs, the PCS100 UPS-I immediately transfers the load onto its inverter and energy storage. Once the utility voltage returns to within acceptable limits, the PCS100 UPS-I will seamlessly transfer the load from the inverter back to the utility.

Jaroenpanich continues, "We chose ABB's PCS100 UPS-I because the product is designed specifically for industrial applications. Its high efficiency rating means it will deliver the best return on investment for us, and its small size and the fact that it doesn't require any additional temperature control means it has a low cost of ownership. The team at ABB are highly professional and we are very confident that the training, installation and commissioning delivered by the factory service technician will enable us to get the best out of the system. We estimate that we'll see a return on our investment in five to six years' time, based on production figures and opportunity loss calculations."

Inspiring change

ABB's PCS100 UPS-I is the first of its kind to be installed in Thailand, and the first such model to be installed in a Japanese automotive plant in South East Asia. Jaroenpanich expects other industries to follow suit, "With the protection ABB's PCS100 UPS-I delivers, we expect to see a reduction in the number of car body losses from the painting process saving us around 1 million Thai Baht each year (approximately \$29,000 USD). We also expect to reduce the average outage time to 5.8 minutes, saving around 3.3 million Thai Baht (\$95,600 USD) per year. The low maintenance cost and the ready availability of replacement parts means limited downtime for the process line, ensuring we can run at maximum efficiency for a greater amount of time. Our increased productivity is sure to serve as inspiration for other businesses operating in Thailand."

With Toyota's 'Global Vision' strategy, which calls for dominance in emerging markets, at full steam a reliable supply of clean, uninterrupted power will be key to the automotive manufacturer's success. The modular inverter construction and failsafe bypass mechanism of ABB's PCS100 UPS-I delivers the highest system availability. Coupled with the small footprint and easy serviceability, this low maintenance, high efficiency industrial UPS is the solution for all power protection applications.

To find out more about ABB's power protection solutions:

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