Enhancing power quality for Koja Container Terminal
Reactive power compensator Dynacomp helps ensure grid compliance

The Koja Container Terminal in Jakarta is owned by TPK Koja. The port hosts 450 ships annually and has a capacity to take 600,000 twenty-foot equivalent units of containers each year. The terminal has seven quay cranes that operate simultaneously and move each container in less than two minutes.

Sea transport has been the largest carrier of freight throughout recorded history. Today, it remains just as important as 90% of international trade is being handled by merchant shipping. Quick cargo handling at ports is critical to reduce the cost of docking and technology is a major factor in achieving this.

The power quality challenge
The cranes at the port use DC drives to enhance the efficiency of their motors. Yet, DC drives have an inherent nature of drawing high reactive power from the source and, so, operate at low power factor. This results in poor power quality due to fluctuations in voltage, also leading to poor performance of other electrical equipment connected to the same network.

Poor power quality can damage the port’s electrical system. It is also prone to spreading through the supply grid and can cause disturbances such as voltage fluctuations in the electrical networks of other users on the same grid. In some cases, penalties are incurred by the utility company. Koja Container Terminal was being penalized up to $50,000 per month from the utility.

An efficient and cost-effective solution
Koja Container Terminal approached ABB for a solution to its power quality challenge. ABB conducted a detailed study of the electrical parameters of the network and found that the system has low power factor, limiting the flow of active power. ABB designed and supplied a power electronics based compensation system called Dynacomp. This is a low-voltage thyristor-switched capacitor bank which can be used for ultra-rapid, power factor compensation. It is used to improve power quality of the network when deploying large or fast varying loads such as harbor cranes, rolling mills or welding machines and ensuring compliance to utility standards.
“There have been impressive benefits of installing ABB’s Dynacomp in our harbor,” said Marinus Saroengallo, Deputy General Manager of Engineering at Koja Container Terminal. “The power factor is approximately 0.97, well above the specified limits of the utility of 0.9. This means that we have saved on penalties from the utility. The improved power quality has also led to significant energy savings and the operations are more efficient and cost effective now.”

ABB’s reactive power compensator, Dynacomp, is just one of a wide range of ABB products, systems and services that can significantly help improve power quality. As a pioneering technology leader ABB offers products and solutions to enhance power quality in low, medium and high-voltage applications.