ABB’s grid automation solution increases reliability of BP oil refinery

BP Kwinana Refinery increased its network’s reliability and moreover its personnel’s safety and reduced the risk of substation damage caused by arc flash by using a new concept of bus transfer with ABB’s high-speed transfer device SUE 3000.

BP Kwinana Refinery is located approximately 35-kilometers south-west of Perth. The refinery started operations in 1955. It is the only oil refinery in Western Australia and, with a capacity of 146,000 barrels per day, it is the largest oil refinery in Australia. In early 2017, the refinery invested approximately $80 million in its largest ever maintenance activity to upgrade the facility and it continues to make targeted investments in order to continue to operate safely and at its best.

BP Kwinana Refinery searched for a new solution that responds to different safety and operational requirements. The old concept of low-voltage switchgear operated with ‘open’ bus-tie was used to limit the risks of arc faults and to avoid losing the entire substation or injuring personnel. But this provision reduced the reliability of the switchgear, making them susceptible to upstream tripping causing that section of the bus to fail.

The key idea of the operating philosophy was to reduce arc fault occurance and enable a bus transfer in the event of failure of any single incoming feeder due to an upstream fault or feeder trip. Using the bus transfer with SUE 3000 at the substations ensures availability respectively by automatically transferring supply to a healthy incoming feeder. ABB engineered, tested and installed the entire new concept of the bus transfer with the high-speed transfer device SUE 3000.

ABB’s high speed transfer device SUE 3000 is applied to the changeover of the feeding busbars from their normal to backup supply feeder and vice-versa. This function is usually needed in auxiliary supply systems of power stations and industrial plants. The SUE 3000 is easily combined with the existing protection devices and circuit breakers - independent of the manufacturer. The device ensures continued supply to the consumer through the automatic transfer to a stand-by feeder, which protects the subsidiary process from expensive stoppage times.

In addition to SUE 3000, the refinery is also powered by EMAX 2 ACB and feeder protection relays.