# Wind Turbine excess energy dump system

## Existing system overview

The wind turbine was rated at 400kW but in gusty conditions could peak to around 480kW for short time periods. To reduce power the blades pitch but as this is a mechanical operation it can take a few seconds. The maximum export of energy to the grid was 400kW so a solution was required to stop the over export.

For similar sites in the past, solid state relays were used to switch in 12kW stages on a load bank. A Siemens controller took a 4-20mA signal from a power transducer and at pre-set values, switched loads on and off to divert excess power. These were usually 96kW load banks made up of 8x 12KW 3PH heaters.

Downside of using multiple SSR's was the additional wiring involved as each load needed wiring back to the relay panel and cost of suitable solid state relays.

This specific project also required voltage capability up to 690Vac, which eliminated many suppliers. Supplied unit, RC3120-77APl02010.

## Implementation

REVO-C was directly fed from a Socomec A40 power transducer with 4-20mA output and set to control the power to the dump load and divert excess power. During normal operation, when the turbine is operating up to 400kW, REVO-C is idle. From 400 to 500kW the transducer gave a 4-20mA signal (0-100%) and REVO-C powered the 96kW heater load bank. Power feedback was seen to give the best results.

The heater bank was situated in a stainless steel enclosure external to the turbine tower, while the REVO-C was mounted in its own cabinet within the tower itself.

## Conclusion

Using REVO-C gave a simpler set up, less wiring and lower cost on the hardware compared to traditional SSR's or contactors.

**Conventional Diversion Load Diagram**

| Rectifier | Battery | Diversion Load Controller | Dump Load |
| --- | --- | --- | --- |

| | | Inverter | Loads |
| --- | --- | --- | --- |