inMotion
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VLT® drives heat up Copenhagen passing under the royal castle

Copenhagen Energy's district heating system provides 98% of the city with clean, reliable and affordable heating. This heating system uses heat from waste incineration plants and combined heat and power plants.

Early in 2010 the main supply of heat changed from two old coal-fired power plants to the renovated Amager Power Station – a high efficiency coal and biomass power plant. The steam and water pipes run in a new tunnel under the harbour - connecting the power station to the city heating system. This project was the second largest and most challenging civil engineering project in the history of Copenhagen. Interestingly, the tunnel is placed right below Amalienborg – the home of the Danish royal family.

The new tunnel and pumping station are owned by Copenhagen Energy and Amager Power Station is owned by Vattenfall. The engineers from Vattenfall have designed the pumping station that moves the hot water and steam into the city – and brings the return water and condensate back to the power station.

Reliability and energy efficiency
Key criteria in the design phase were reliability and high energy efficiency. The system was commissioned in October 2009 and will be in full operation in December 2010 – ready for a long, cold winter.

Saves 200,000 t of CO_2 a year
The total cost of the project, in excess of € 100 m, will be paid back by the annual savings in energy and operational costs after approx. 15 years – so, the citizens of Copenhagen receive clean, reliable heating at no extra cost – and save 200,000 t of CO_2 every year.

New pump building

6 x 355 kW water pumps

VLT® AQUA Drive
There are 6 x 355 kW pumps for the forward and return flow of heating water and 3 x 160 kW pumps to pump the water from the power station through the heat exchangers.
4 x 37 kW pumps are used to bring the steam condensate back.
All pumps are speed controlled by Danfoss VLT® AQUA Drive, type FC 202.
"We selected Danfoss because they offered the right product solution and the best value proposition" says Michael Skou Behrndtz, MSB Electrical Engineering, who designed the electrical system for the pumping building.
"We expended a lot of effort to prevent problems with EMC and harmonic distortion as we know it is easier to do it right first time than to try to solve problems afterwards."

Running on one transformer
He designed the pump house with 2 x 10kV/400V transformers which normally run in parallel – but the system will keep running on one transformer in the event of a failure or for maintenance.

Built-in DC link chokes to keep the harmonic distortion down
The built-in DC link chokes of the Danfoss drives are sufficient to keep the harmonic voltage distortion below the site standard - but there are provisions to add an active harmonics filter if the heating capacity is increased and more speed controlled pumps are added.

Guaranteed availability of spare parts and qualified service
All the Danfoss drives in this project are covered by a service agreement with guaranteed availability of spare parts and qualified service engineers on standby 24/7/365.