
Demand Driven Distribution - great for more than leaks

DEMAND DRIVEN DISTRIBUTION – GREAT FOR MORE THAN LEAKS

The Demand Driven Distribution concept has wide-ranging implications for pumping systems. In The Netherlands, for example, it has helped drive down energy consumption and maintenance costs for the Dunea water company.

DEMAND DRIVEN DISTRIBUTION – ALWAYS THE BEST OPTION

Marcel van Veen from Grundfos Netherlands has no doubt: “I find that the Demand Driven Distribution concept is absolutely the way to build a pumping system, especially where the capacity ranges are very wide. This is true even when water leakage is not a major issue, which it isn’t really in The Netherlands – for a DDD system drives down energy consumption and maintenance, which will always be important. That is why we keep asking for details about the applications when we make our recommendations, not only about duty points.”

NEW BOOSTER SYSTEM FOR DUTCH WATER COMPANY

The DDD principles were brought into action when the Dunea water company needed a new booster station – “Booster Hillegom”. Dunea is one of the ten drinking water companies in Holland and provides drinking water for approximately 1.2 million clients in the South West part of The Netherlands. The company’s main source of water is surface water, but they also buy drinking water from Waternet, another drinking water company. This is where the new booster system comes in, for the water intake from Waternet was to be carried out via Booster Hillegom.

TOPIC:

The Demand Driven Distribution concept has helped drive down energy consumption and maintenance costs for the Dunea water company in Holland.

LOCATION:

Dunea, Holland

COMPANY:

Grundfos Netherlands

VERY WIDE CAPACITY RANGE

The capacity range required by the station is quite unusual: Normal operation consists of between 80 – 300 m³/h, heads from 22 mwc up to 36 mwc. The average capacity requirement for the station is 140 m³/h at 23 mwc; in case of emergencies the booster station should be able to supply 700 m³/h at 36 mwc.

“WHAT CAN YOU DO FOR US?”

When Dunea asked Grundfos to suggest a solution for this project, they had no specific pumps in mind – they simply described the application and its capacity and head ranges and presented Grundfos with the challenge of coming up with the best possible solution. Dunea invited a total of five pump suppliers to meet the challenge, stating that the three companies to offer the most interesting proposals would receive an official inquiry in January 2010.

ENERGY-EFFICIENT, LOW-MAINTENANCE SOLUTION

Grundfos proposed a three-pump system consisting of NB 100-315/334 with a rated motor power of 30 kW each. All pumps were to be equipped with VFD and controlled by means of MPC controls. That solution was not the only one being considered; the Grundfos team also looked into the possibility of installing a four-pump NB system or a Hydro MPC-E solution. Overall, four different possibilities were considered by the Grundfos team:

3 x NB 125-315/336 with 37 kW 3 x NB 100-315/334 with 30 kW 4 x NB 80-160/177 with 30 kW Hydro MPC-E 5 CRNE 150-2 with 22 kW

Eventually, the team’s analyses showed that the three-pump NB system was the best alternative in terms of both energy consumption and maintenance requirements.

CAREFUL STUDIES OF ALL ALTERNATIVES

The decision was not lightly made. For a while, the 4 x NB 80 alternative looked promising: it showed the highest capacities overall. But then an extra pump would be required and the pit would need to be larger. Furthermore, an extra VFD and extra maintenance would be needed. This would have a negative effect on the total cost of ownership for the client. Therefore, Grundfos decided to go ahead with a three-pump solution and see if that could achieve what the client wanted.

The 3 x NB 125-315/336 covered the complete range, even the emergency point, without going above 50 Hz. However, efficiency could be better, so the Grundfos team came up with the option of using 3 x NB 100-315/334 or a four-pump solution, both 30 kW. These solutions would ensure better efficiency at approximately the same power consumption.

However, a three-pump solution requires a smaller pit and, obviously, lower expenditure, which prompted Grundfos to make this final recommendation. As an added bonus, the NB pumps are easy to maintain and allow for a better piping layout in the pit than an in-line system does.

CLIENT WITH AN OPEN MIND

When they called for design ideas, Dunea had certain plans in mind, but did not show them to potential suppliers – they did not want to restrict creativity in the solutions offered. It later transpired they their own initial design planned to have suction and pressure headers on the left and right side and in between multistage pumps. After talks with Grundfos, however, Dunea were convinced that NB pumps were the most efficient choice for then – and that the headers could be positioned above each other, close by the wall. The system allows for a more open pump configuration, making access much easier for staff.

FULL BOOSTER STATION? CERTAINLY!

Dunea were favourably impressed by the design proposal and were intrigued to learn that Grundfos could offer to supply the complete booster station, including the concrete pit and electrical work. Tentative plans were drawn up by a team comprising members from Dunea, Grundfos, a constructor (Visser & Smit Hanab), and an electrical engineering group (Cegelec).

FINAL DESIGN MATCHED INITIAL GRUNDFOS SUGGESTION

Eventually, the design was finalised and building on the new booster system began in June of 2010. The final design incorporated the three-pump NB system with CUE VFD's and MPC controls exactly as they had been presented in the original plans from November 2009. The system supplied consists of:

Pumps: 3 x NB 100-315/334, 3 x 400 V - 50 Hz, 30 kW EFF1 with insulated bearing NDE, bronze impeller
Pump control: 1 x Control MPC-E 3 - 30
Frequency converters: 3 x CUE 30 kW

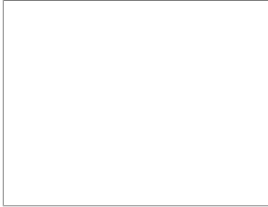
The system – and overall building project – was completed in February 2011, and the system is now working to achieve the ambitious goals set by Dunea.

CLIENT: "FITS OUR POLICIES ON RESPONSIBLE ENERGY CONSUMPTION"

As Mr Rob de Jong, Distribution Specialist at Dunea puts it: "The Grundfos Demand Driven Distribution pressure management system fits exactly into Dunea's Policy Intention for 2015: With its inherent features, Demand Driven Distribution represents

the most responsible way to use energy in our systems – and gives us the means to monitor this."

Related Products



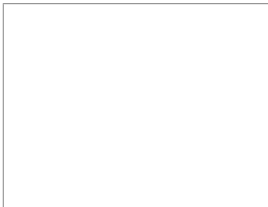
CONTROL MPC - MANAGING BOOSTER AND CIRCULATION SYSTEMS

Grundfos Control MPC - a control cabinet with a CU 351 controller that lets you monitor and control up to six identical pumps connected in parallel.



HYDRO MPC

Complete booster system



NB, NBG, NBE, NBGE

A complete range of non-self-priming, single-stage, centrifugal volute pumps.