Abstract

Switching from Pumping Zones to Pressure Zones, Case study of Nablus City

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Previous Situation

The natural mountainous topography of Nablus city (see attached photo at the end of the report) is one of the main challenges in operating water system. More than 400 m was the difference in level between some water resources and distribution points (see attached photo at the end of the report). The pumping pressure reached up to 25 bars in some pumping stations, this lead to high operating and maintenance cost.

40% of water operating cost was energy, frequent failure in water distribution components (pipes, pumps, domestic water meters and fittings) happened due to high operating pressure.

Also the same pump was used to distribute water a on rotational basis to different distribution Pumping Zones that have various elevations. Therefore, the pump could not operate at optimum point. In addition to that, the previous situation had many problems which reduced the efficiency of operating water distribution system in the city.

Current situation

Water Loss Reduction project funded by Kreditanstalt für Wiederaufbau (KFW) with 20 Million € budget, this project was started in 2007 and completed in 2011. The main aim of the project was to reduce the Non Revenue Water (NRW) from 40% to 25% and to reduce the energy consumption.

Through water loss reduction the water distribution network and related facilities have been rehabilitated and restructured. The project included physical implementation comprised of laying new water pipes and house connections, installation of 28 pressure zones, as well as the rehabilitation and construction of relevant reservoirs and pumping & booster stations.

Major parts of the systems were put in operation at the beginning of 2012, however works are still ongoing and challenges have to be faced.

Although splitting of water distribution pumping zones into pressure zones required large investment because it needed additional pumping stations, reservoirs and transmission lines. It became more economical in operation since energy consumption had been reduced by 35 % compared to the past.

The main fruits of implementing the project are (but not limited to) the following:

The energy consumption was reduced from 0.93 KWH per cubic meter to 0.59 KWH.

The project resulted in reduction of physical damage of the distribution system components, even at the customer's side behind the water meter.

Facilitating the computation of water balance and managing NRW Considerable reduction in customer complains.

As well, physical water losses in zoned networks are reduced as a result of a lower pressure in pipes and especially in indoor installations.

However, the commercial losses are still high due to over-aged domestic water meters which the municipality is intending to start to replace accordingly in the near future.