





Water losses reduced by up to 40% – the example of Ain Al Basha, Jordan

Project title	Water loss reduction in Ain Al Basha through effective pressure management (PM)
Name of area	Ain Al Basha, Amman Jordan
Service connections	4,098
NRW	47.1% (2005)
Project period / status	January 2007 - July 2008 (completed)

Background

Jordan was estimated to have a non-revenue water (NRW) level of more than 50% in 2004. This is quite alarming given that Jordan is considered to be one of the ten most arid countries in the world.

The condition of the Ain Al Basha water distribution system poses a great number of problems: a very high percentage of real water losses consumes considerable financial and natural resources and leads to a limited supply of water for service customers. Furthermore, strong pressure variations within the system lead to frequent new pipe breaks.

Process development

The objective of the project was to reduce real water losses by means of effective pressure management methods and increasing the capacity of staff dealing with

network operation. The project was undertaken in close cooperation with the Water Authority of Jordan (WAJ) and generally envisaged in two phases.

Phase I: technical installation of a pressure management system

A feasibility study, comprehensive data collection, documentation and evaluation had to be undertaken at the beginning of the project. The various equipment parts were then fabricated, delivered and installed according to the detailed project plan.

A SCADA system was installed and connected to the WAJ's office in order to operate the PM system at its full potential and to monitor its performance continually. This step enables technicians and engineers to monitor and control the system precisely based on live data and to react quickly to changing demands.

Phase II: embedding PM knowledge

Once the technology was installed, extensive training courses and on-the-job instructions were undertaken to enable the local partner to continue operating the new system. The WAJ's managers and trainers attended an intensive training course in Germany at the outset.

At the same time, VAG experts helped to improve a local training centre for water engineers in Amman. The facility was equipped with training valves and wall charts, and will be used to teach 400 to 600 technicians and engineers per year on how to use valves and pressure reducing valves in the appropriate way. Additionally, Jordanian trainers have been trained in order to sustainably incorporate PM knowledge within the WAJ. Considerable time was spent on practical and theoretical training on the valves. At the end, the trainers had the opportunity to practice what they learned.

Good practice

The projects' advantages for the WAJ include:

- increased efficiency and lower water supply costs
- fewer pipe bursts through controlled and reduced pressure
- increased lifetime of pipe system
- water losses reduced (down to 30% NRW), saved water used to increase/improve water supply
- controlling the valves via the SCADA system
- evaluation reports (day/week/month/year)
- capacity development for Jordanian staff.

Reduction of minimum night flow (Flow 2 am)					
Date	No control (m ³ /h)	Date	With control (m ³ /h)	Minimum night flow reduction	
03.02.2008	55,01	02.03.2008	37,20	-17.81 m ³ /h	32%
04.02.2008	55,01	03.03.2008	37,92	-17.09 m ³ /h	31%
05.02.2008	62,86	04.03.2008	35,28	-27.58 m ³ /h	44%
06.02.2008	49,46	05.03.2008	34,08	-15.38 m ³ /h	31%
07.02.2008	51,30	06.03.2008	32,37	-18.93 m ³ /h	37%
08.02.2008	56,65	07.03.2008	41,05	-15.59 m ³ /h	28%
09.02.2008	47,16	08.03.2008	36,90	-10.27 m ³ /h	22%

Results obtained in the district of Santo Amaro between January 2005 and June 2006

Lessons learned

The project's approach of not only implementing PM systems, but also embedding knowledge on PM within the local partner's structures was successful. The WAJ monitors the PM system through the SCADA technology. Additionally, support from VAG can be requested at any time via the internet. Extending the WAJ training centre for water engineers by offering PM courses in Amman caters to sustainable capacity development which is further underlined by the *train-the-trainer* concept.

References

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- GTZ Jordan website, www.gtz.de/en/weltweit/maghreb-naher-osten/1511.htm, visited July 2010.
- Pressure Management website, www.waterlossreduction.com, visited July 2010.
- Dorsch Gruppe, Engicon and sebaKMT, *Effective Leak Detection, repair & maintenance Management in Ain Al Basha district - PPP Jordan*. Not published, 2009.