



## Water Loss Reduction through Pressure Management

### Background

Drinking water is a precious resource in many developing countries and countries in transition. However water loss is often high (40% or more of conveyed drinking water), caused by insufficient maintenance and leaking pipes. Pressure peaks increase leakages and new pipe bursts, allowing sewage and other pollutants to infiltrate the pipe network. This can cause the spread of diseases such as cholera, typhus and diarrhoea that are prevalent especially in the summer months. It is therefore important to protect water resources through future-oriented approaches

in the operation and maintenance of the existing water supply system. Pressure management will help improve the situation.

### Project

The project's aim is to reduce water loss by improving the management of existing water supply networks by local water utilities at three different levels of intervention (*see boxes*):

#### 1. Guidelines for Water Loss Reduction with Focus on Pressure Management (PM)

The guidelines address decision-makers and relevant stakeholders at the national level, and the management, planning & design department and the operational levels of local water utilities. They comprise three documents: (a) summary – policy and management, (b) technical manual – planning and design and (c) working materials – implementation, operation and maintenance. The guidelines aim to raise awareness and understanding of the different types, reasons and impacts of water loss, and will contain comprehensive working materials on PM. They will also outline strategies to solve existing problems in water supply networks. Methods and instruments for analysing the current state of water utilities and for developing action plans will be documented, besides the basic requirements for the sustainable management of existing water supply networks. PM will be explained including the installation of valves, additional components and remote control technology.

Draft  
March 2010

Discussion  
April - July 2010

Final Version  
November 2010

#### 2. Capacity Development through dialogues, training and on-the-job instruction

To ensure implementation of the guidelines, target group-oriented workshops and training will be necessary. Based on needs assessments in the three target groups, training plans and materials will be developed on the management of water supply networks including valve dimensioning, maintenance and repair. The contents of the summary for decision-makers, handbooks and the working materials will provide the framework for a 3-day training, to be held in five selected countries. Participants will include technical directors and technicians of local water utilities as well as potential trainers for local training institutions.

Concept for trainings  
May 2010

Materials  
July 2010

Trainings & Instructions  
ongoing



### 3. Demonstration of improved water management in pilot areas

The implementation of the guidelines will also require technical installations of modern valve technologies in two selected pilot areas. These pilots will serve as practical examples for the discussion on best practices regarding the design and management of water supply networks. Upon completion, it will be proven that the number of leaks in the pipeline system could be reduced due to pressure management. The basic requirements for the pilot countries are an existing network register, a basic hydraulic network model, water balance and a representative District Meter Area (DMA). A list of requirements is available.

Identification  
March 2010

Action plans  
December 2010

Implementation  
June 2011

### Impacts

The use and implementation of the developed guidelines and the included recommendations on how to overcome existing problems will lead to more sustainable network management, including a reduction of water loss and the guarantee of constant and safe water supply. Additionally the guidelines will contribute to a more preventive operation and maintenance of the networks, which is less cost-intensive than repairing current damages over a long term (rehabilitation). Furthermore the development measures will contribute to the following indirect impacts:

- Reduction of water loss
- Increase in water supply (hrs/day)
- Increase in number of households having access to public water supply
- Reduction of pipe bursts
- Increased lifespan of network
- SCADA Monitoring System included in the system

- Equal and fair water supply distribution considering social constraints
- Improved short, mid and long-term investment planning for the sustainable management of water supply networks

The training of technicians, technical directors and representatives of governmental authorities leads to more efficient maintenance and management of the networks and water loss reduction. Future construction, maintenance and financing decisions will be made based on a well-founded database and with a mid to long-term perspective. The improved management and maintenance of the water networks will reduce the pollution of drinking water (quality issues) and will therefore decrease water-borne infections through cleaner and safer water supply.

VAG-Armaturen GmbH is a highly experienced manufacturer of valves for water and wastewater applications. The frequent introduction of innovative products has given the company the reputation of being a pioneer in providing modern, global solutions. Currently VAG has manufacturing sites in Germany, the Czech Republic and China and employs more than 950 persons worldwide.

Karlsruhe Institute of Technology (KIT) through the Institute for Water and River Basin Management (IWG) situated at KIT. This institution, which is known for its internationally excellent research and teaching in natural and engineering sciences, is a merger between the Forschungszentrum Karlsruhe (a member of the Helmholtz Association) and the Universität Karlsruhe.

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH is an international cooperation enterprise for sustainable development with worldwide operations. The federally owned GTZ supports the German Government in achieving its development policy objectives. The enterprise promotes complex reforms and change processes and its corporate objective is to improve people's living conditions on a sustainable basis.

University of Applied Sciences Northwestern Switzerland (FHNW) through the Institute for Ecopreneurship (IEC), which is one of four institutes at the School of Life Sciences (HLS) of FHNW. The IEC's focal area is the teaching and applied research in the fields of sustainable resource management, biotechnology and eco-toxicology.



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