

Purpose of the example	
Demonstration of water loss reduction based on sectorization, active leakage control and advanced analytics for event management.	
General information on the water utility or project	
Name of town/project/utility	Mei Carmel (The water utility of the city of Haifa)
Type of project	NRW reduction project
Scope of project	Sectorization (DMA) and NRW reduction
Contact (optional)	Mr. Eng. Nir Naveh nirnaveh@handasi.co.il
Asset manager/project manager	Ms. Eng. Reut Gotfrid ReutG@mei-carmel.co.il
Service contractor	Led by utility
Population (people served)	300,000
Length of network and age of system	600 km
Number of service connections	12,500 connections/30,000 households
Number of pumping stations	13
Special conditions	The topography of the city starts at sea level and goes up to 480 meter above sea level on the Carmel Mountain.
Project related ISO standard	ISO 24528
GIS in use, since when?	2013
Main methods and tools	DMA, Pressure Management, Remote metering by "CityMind", analysis and management by " TaKaDu "
Initiation and main features of the project (AM/water loss)	
Objectives and policy/regulation, if relevant?	
The project goal was reducing NRW from 15.9% to 7%	
What are the main actions in the recent past (lengths of rehabilitated network, acquisition of knowledge, active leakage control, pressure management, DMA...)?	
Sectorization of 50% of the system, 83 DMAs (2014-2018), installation of 500 noise loggers (2013), search for leaks with Helium, installation of pressure management in few DMAs (2014), monitoring data with data loggers (2015), implementation of "TaKaDu" event management system, continue monitoring	
What are the tools, criteria, performance indicators, technologies, used to implement the project (see e.g. ISO 24523 or ISO 24528)?	
DMA sectorization, Data loggers for monitoring flow and pressure, Pressure Management, Fixed leak detection system, Advanced analytics for event management, NRW percentage.	

Project activities
Main activities (leak repair, pipe renewal, special techniques, ...): (include figures or volumes if available)
Replacing 40% of water meters (2010-2015), renewal of 100 km pipes (2010-2013).
Outcomes of the asset management policy
Results. What are the main outcomes in terms of impact on the assets, the operation, the planning of works, etc.?
NRW reduction from 15.9% in 2013 to 6.4% in 2020. Mei-Carmel established a NRW Department led by an engineer, the operational teams are activated to address events detected by the TaKaDu system. The NRW is reduced and maintained in low required level. The utility management created NRW committee that reviews the system's performance and decides on actions required to be taken.
Setbacks, failures, upcoming activities (optional):
Expand the DMA coverage to the entire system of the city water network.
Financial aspects
How is the project budget defined? What are the constraints? What is the impact on tariff? Is there a specific budget dedicated to asset management policy, on top or instead of usual budgets (OPEX and CAPEX)? For what duration?
The project cost over the years was ~ 2,000,000 US\$. No impact was applied on the water tariff (regulated tariff).
Impact on the operational costs quantified or analyzed and which method is used?
Indicate financial criteria (e.g., return on investment), give figures
The ROI of the project was less than 1 year.
Method for the estimation of the value of assets (optional)?
Recommendations for a good management of assets
Conclusions, return of experience (lessons learned)
DMAs sectorization is required to monitor the entire network. The advanced analytics for event management can accommodate a complex sectorization without having to isolate pipes or interrupt the hydraulic performance.
Possible improvements:
Use performance indicators to assess the network condition together with the percentage of NRW, implement Advanced Metering Infrastructure (AMI) for all house service connections to allow real time investigation of water balance.
Outlook and suggested improvements