Current and Future UKWIR Leakage Projects

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Projects recently completed

Leak Detection on Plastic Pipes
- Contractor: Hydrosave with ISVR (Southampton University)

The Effect of Pressure Reduction on Burst Frequency
- Contractor: WRc

Low flow components of Night Use and the Water Balance
- Contractor: Artesia Consulting

Factors Affecting Background Leakage
- Contractor: RPS Consultants
Projects currently in progress

Effect of Weather on Leakage and Bursts

- Contractor: Tynemarch with the Met Office
- Developing relationships to forecast effect of cold winters, dry summers and prolonged wet periods on leakage and bursts

Improved Household Night Use Allowances

- Contractor: Artesia Consulting
- Investigating how weather, seasonality, property type, location and DMA attributes affect household night use.
- Aim is a methodology to derive DMA-specific allowances
Projects currently in progress

Alternative Methods for Quantifying Leakage

- Contractor: Crowder and Co.
- Will DMA water balances be more accurate, simpler and more transparent than minimum night flow analysis for quantifying leakage, once we have full customer metering?

Quantification of Customer Supply Pipe Leakage

- Contractor: Tynemarch Systems Engineering
- Due to lack of data, project scope reduced to specification for data collection
New projects to be started in April 2013

1. Leakage Upstream of District Meters
2. Economics of Supply Pipe Leakage
3. The Accuracy of District Meters
Leakage Upstream of District Meters

- Most previous research on leakage operations has focused on leakage within DMAs.
- Little attention paid to leakage from trunk mains and service reservoirs.
- 2006 UKWIR project simply reported on current UK practice for quantifying these components for regulatory reporting, rather than operational leakage management.
- Wide range of approaches reported – accuracy generally poor, especially for trunk main losses.
- There are no recognised best practice methodologies for quantifying or managing these losses.
- Economics of managing these components of leakage has never been studied. The current estimated magnitudes are simply added to the SELL.
Leakage Upstream of District Meters

This project will investigate:

- Causes, magnitudes and significance of these components of leakage.
- How the magnitudes of these losses relate to materials, ages and construction types.
- Best practice methods for measuring and monitoring upstream leakage (e.g. flow balances, permanent noise monitors, drop tests, etc)
- Appropriate methodologies for operational management of these losses, including real time early warning systems
- Economics of trunk main and service reservoir leakage
- Incorporation of these components into the SELL analysis
The Economics of Customer-side Leakage

- Conventional leakage economics models consider only the mainstream find and fix processes
- Customer-side leakage is included within this, and treated in the same way
- SIM is now driving different and more complex ways of dealing with customer-side leakage
- This project will investigate:
  - the economics of supply pipe leakage management, relative to other leakage management options
  - cost/benefit analysis of waste notice procedures, free supply pipe repairs, subsidised renewals, etc
  - influence of SIM
  - implications of eventual adoption of supply pipes
  - how to incorporate these factors into SELL models
The Accuracy of District Meters

- District metering is universally accepted across the UK as the only way to measure leakage.
- Essential for network management as well as leakage measurement
- 22,000 DMAs across the UK.
- 31,000 district meters in service.
- Almost none of these are ever calibrated after installation.
- We have no idea how accurate they are.
- NEL procedures for verification of DI meters are impractical for district meters.
- Meters operate over a wide range of flows
- Accuracy at low flows is critical for leakage measurement
- Reducing leakage levels means meters may be oversized
The Accuracy of District Meters

- Appraise current meter stock
- Assess accuracy of various types and sizes of meters used, especially at minimum night flows
- May require bench testing of a sample of meters taken out of service
- Determine how accuracy is affected by age and installation conditions
- Recommend best practice for verification
- Assess impact of meter accuracy on leakage management
- Recommend how meter uncertainty should be taken into account in leakage management
- Recommend appropriate meter maintenance and replacement policies