

Non-revenue water

As populations grow, the need to reduce losses of potable water caused by pipe leakages are becoming an increasing concern for local authorities. Certainly a major challenge but, as John Rowe (Secretary-General, International Stainless Steel Forum, Brussels) reports, stainless steel pipes constitute a proven and ideal solution.

Take a moment, if you will, to read that headline again. It is redolent of the modern day sacrilege introduced by business schools and consultants of passing over perfectly good words in English (and other languages) in favour of the use of jargon and techno-speak. Such language can be useful to allow a few words to convey a concept, but it requires caution because, used incorrectly, it may disguise the true picture.

In the sense in which these three words are used today, they refer to the volume of water that is lost, daily, in major cities throughout the world, through the simple expedient of a leaking water pipe, multiplied a billion times. If you had a leaking water pipe in your home, and if you were sensible, you would call a plumber and get it mended, because ignoring it would probably leave you without water and it would certainly cost you money because the bills continue to flow even when the water does not. And, again if you were sensible, you would get it mended properly, so that the problem would not recur.

Now consider a few facts which have from our research: Ofwat, the UK Water Regulator has estimated that more than three billion litres of water leak through ageing and inadequate pipe systems every day; La Stampa, the Italian Newspaper, has reported water losses through leaking pipes in Italy ranging from 26% in the North to a bewildering 46% in the South; researchers estimate that a scarcely believable eight trillion litres of water are lost annually in this way in the United States; Chicago alone loses 83 billion litres every year, according to the Centre for Neighbourhood Technology; and the list goes on. And on.

The cost of repairs

Part of the problem is political. Governments and Municipalities hesitate to take appropriate long term decisions fearing resistance to cost increases by taxpayers. Another part of the problem is the concern about disruption. A major part of the cost of repairing a leak is not



A flexible stainless steel corrugated piping system avoids leaking at joints, reduces the number of joints and resists seismic shocks.

the cost of the replacement pipes, but the cost of digging the hole to change the pipes, and the concomitant cost of disrupting traffic movement and annoying the taxpayers. The final part of the problem is the belief that a short term fix will be sufficient to pass the problem on to the next manager, or the next generation of taxpayers.

What is needed is a decision by the very top of governments or municipalities to fix the problem once and for all. In one of the case studies to which I refer below, the Municipal Authorities in Tokyo gave a directive to fix the problem using the best available material, so that it would stay fixed for generations, and it would be financed by the current generation against cheaper water costs for subsequent generations.

“Inert; corrosion resistant and hygienic - stainless steel is ideal for water pipes!”

A spokesman for the Centre for Neighbourhood Technology observed that “the infrastructure and the massive investment that our grandparents, great-grandparents and in some cases great-great-grandparents put in is coming to the end of its useful life and the bill has come due on our watch”.

Rosie O’Neill, Water Policy Manager of the WWF, commented that water companies and agencies account for the cost of fixing leaks, but not for cost of taking water out of the environment. “This means it is cheaper to drain a

river dry than to fix a leak....” This is a desperate state of affairs and requires urgent attention.

To be fair, a great deal of work is, in fact being done, and hundreds of thousands of taxpayer pounds are being spent every year, in the misguided hope that leaking water pipes are being fixed, whereas, in reality, the problems will almost certainly return, and will just as certainly get worse.

Materials selection

But there is a solution. A long-lasting and completely viable solution. One which can dramatically reduce leaking pipes and which will last for one hundred years or even longer. And it has been tried and tested and it actually works.

The solution recognises that a major part of the existing problem lies in the selection of materials which are simply incapable of performing their designed function for extended periods of time. The solution introduces stainless steel water pipes and pipe fittings. Stainless steel is inert; it has a high strength to weight ratio, making it easy to carry and to manage in tight situations; it is corrosion resistant; and it is hygienic. Once in place, barring accidents, there is no reason to believe that they will not remain in place for more than 100 years. Doing a job once and having the confidence that it will last for 100 years will come as a massive relief to city mayors who are bombarded with complaints from citizens whenever roads are blocked for underground repairs.

This solution was devised by the City of Tokyo’s Water Board in the early 1970s, at a time when Tokyo faced a severe water shortage and conservation had become critical. After researching a number of competing materials in underground tests for a period of ten years, the Water Board recommended the use of grade 316 stainless steel and the city agreed. In a 32 year project, from 1980 to 2012, 100% of the service pipe network (carrying water from the mains supply to the doorstep of consumers) was changed to stainless steel, including stainless steel joints, elbows, valves and other fittings.

This work ran simultaneously with two parallel projects: dividing the city into manageable grids and ensuring that each grid was inspected for leaks on a regular and systematic basis; and introducing a rapid response team to fix leaks whenever they were detected. None of these three parts of the overall project can operate without the other two. Introducing stainless steel does not mean there will never be leaks; it will simply reduce their frequency level to manageable limits and make them easier to repair.

This project reduced annual water leakage in Tokyo from 17% to 2%. And the strength of the stainless steel



John Rowe is the Secretary-General of the International Stainless Steel Forum, based in Brussels, Belgium.

pipes was amply demonstrated by an inspection of the damage done in Tokyo by the aftershocks from the Great Sendai Earthquake of 2011, which is renowned for the resultant Tsunami which destroyed a nuclear power plant. An inspection of the city’s water system after that earthquake showed that less than 5% of the stainless steel water pipes had been damaged.

That project has since been repeated in Seoul and Taipei, with the same very significant success.

Spreading the word

The International Stainless Steel Forum has spent two years studying these three projects, together with its colleagues in the Nickel Institute, the International Molybdenum Association and the International Chrome Development Association and has published a Brochure, which may be viewed here (http://www.worldstainless.org/Files/issf/non-image-files/PDF/ISSF_A_workable_solution.pdf), and prepared a presentation and road show, including samples of the types of stainless steel pipes which have been used and also a miniature model. That road show has been presented to the Mayor’s office in London; to ACEA, the Water Authority for major parts of Italy, including the drought threatened City of Rome; to Water Authorities in Australia, South Africa, India and the United States. This year it will be taken to water conferences in Cape Town and London. If your organisation would like to see more details of how those great cities in Asia have managed to achieve such remarkable reductions in water losses, please contact the author at john.rowe@issf.org. Our goal is to spread this message as widely as possible.

The International Stainless Steel Forum is a non-profit organisation, based in Brussels. We are not asking for money and we do not require investment. Our interest in this project is to increase the demand for stainless steel, and to demonstrate how this grade of material can provide an enormous, incalculable benefit to the environment, through the simple medium of stopping water leaking from pipes. Forever.



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