

Remote, self powered sensing and transmission of data on water pressure and flow rate



Energy Harvesting 2015

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Introduction

- Piezotag Ltd
 - UK based SME
 - Working on EH solutions for 11 years
 - Projects in:
 - Industry
 - Automotive
 - Utilities

EH for water - Introduction

- The UK water industry:
 - Large, widespread asset base
 - Ageing infrastructure
 - Govt. pressure to improve service and reduce cost
 - Water industry requires more data to fulfil this aim:
 - Proliferation of battery powered sensor/data logger/GPRS transmitters
 - High OPEX cost in comparison to EH solution
 - More loggers = more OPEX



The business case

- Around 22% of all potable water is lost through leakage
- Leaks cost the UK water industry over £260 million pa*
- Ofwat's water leakage targets will continue to tighten
- General industry desire/requirement for real time monitoring supports migration from one-life battery usage to EH system deployment – the 'IoT in Water'.

*based on £0.0097 per litre processing cost and a leakage rate of 7.5 million litres per day for Severn Trent Water who provide 10% of the UK's water supply.

The business case

- UK water has around 100k battery powered loggers/GPRS data transmitters deployed
- Battery Life 5 years – Cost/replacement = £300
- EH Life expectancy 20 years - Cost/unit = £200
- ROI:
 - £10 million in first 5 years for UK water
 - £30 million every 5 years thereafter

EH systems offer a cost and eco - efficient alternative

The project

Partners:

- Innovate UK
- Severn Trent Water
- Coventry University
- Piezotag Ltd
- EMD Ltd

Aims:

- Develop a working EH prototype system
- Power industry-standard logger/GPRS transmitter



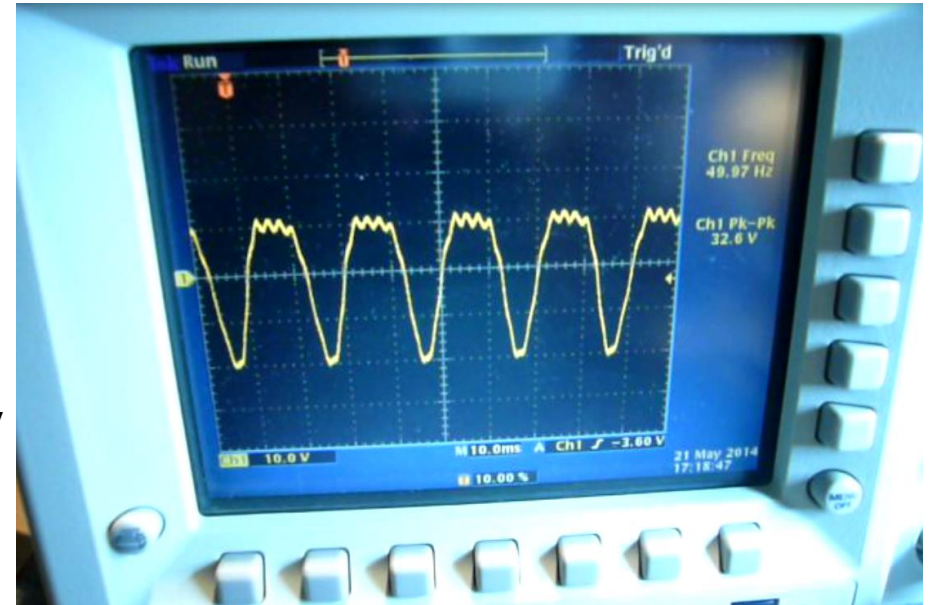
The project

- Exploit vortex shedding phenomena
- Induce a rocking motion in the EH assembly.
- Frequency of the rocking motion is determined by water velocity



The project

- Voltage outputs from the Piezo array are typically in the order of 30/40 volts AC
- Power conditioned to 6-12V DC.
- Current project:
 - EH system as a power unit only
- Future aims:
 - Pressure/flow sensors attached to the EH assembly
 - 1 point of entry into the water main



The project

- Purpose built water flow/pressure rig at Coventry University
- Testing EH systems under typical DMU conditions is now possible
- Current work:
 - Bench testing EH units and powering the data logger/GPRS transmitter
 - Testing on C.U. rig
 - Project completion – April 2015



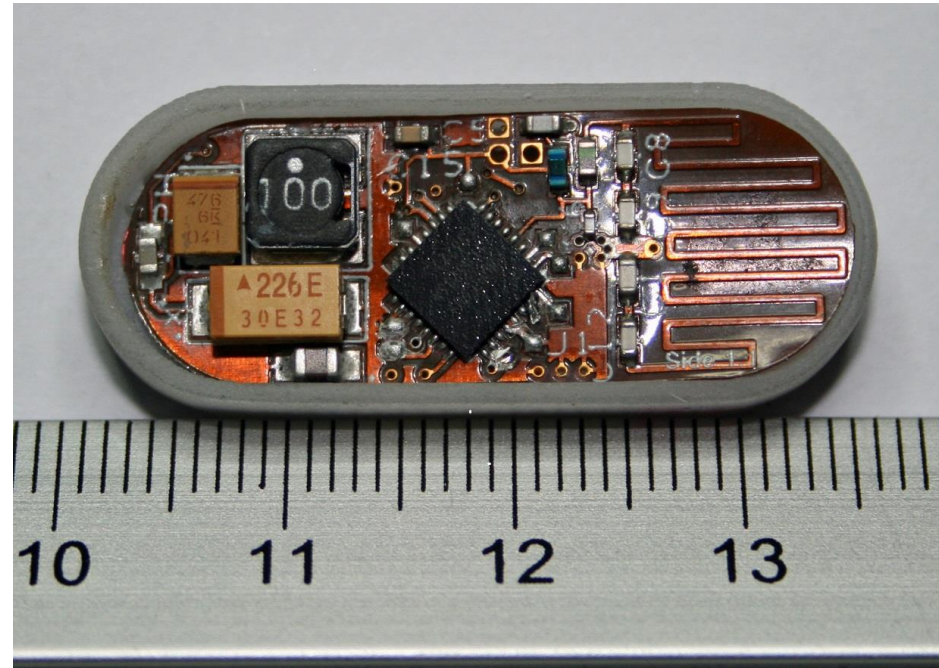
Next steps

- Development of a prototype for 'live' testing
- Closer engagement with:
 - Water co's
 - Data logger manufacturers
 - Water industry contractors
 - In:
 - UK
 - EU
 - USA



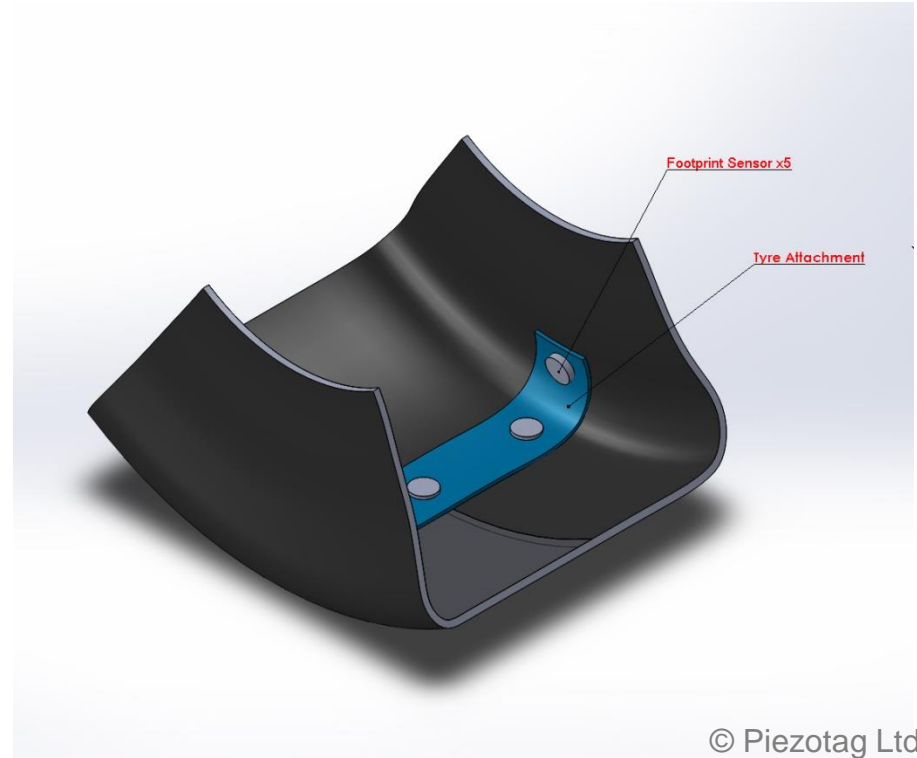
Other projects

- EH supported RCM device
- Embedded in PVC moulding at time of manufacture
- Small size
- Low cost
- 20 year life expectancy



Other projects

- EH supported tyre data capture systems
- In development now for
 - F1
 - Large OTR (Off The Road)



Aims

- EH support for RCM systems in:
 - Renewables
 - O&G
 - Built environment
 - Road transport
 - Marine



Contact details



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