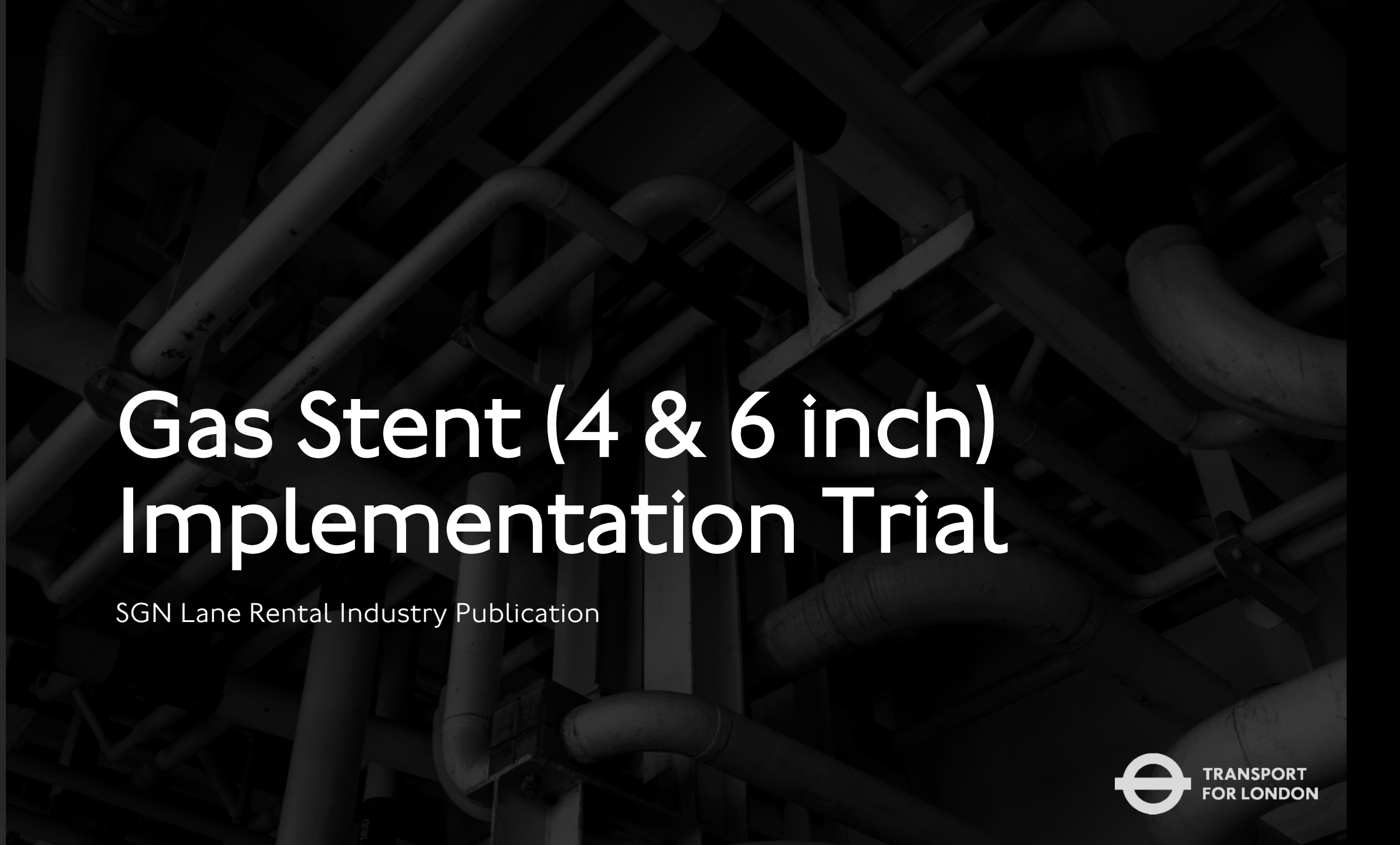


Gas Stent (4 & 6 inch) Implementation Trial

SGN Lane Rental Industry Publication

TRANSPORT FOR LONDON

Introduction

Making sure the gas distribution network delivers gas safely and reliably means that sometimes upgrades or repairs need to be undertaken. Historically, pipes were made from cast iron and over time would become more susceptible to leaks. To improve the condition of the network and limit the number of leaks that arise from this aging network, a 30-year replacement programme is currently underway to replace the old mains with polyethylene plastic to increasing longevity, so the gas network can continue to be safe and reliable long into the future.

While significant work has been undertaken to reduce the frequency of gas escapes, they continue to occur, although infrequently, due to unforeseen circumstances like pipe fractures, leaking joints and third-party damage etc. Responding to high volume gas escapes can cause significant disruption to the public while operatives locate, excavate and repair the asset. This is usually achieved by attaching a repair collar around the pipe. During this time gas is released into the atmosphere, which needs to be heavily monitored and controlled to maintain safety.

The time taken to undertake a repair depends on factors such as engineering complexity, ground type and location of other utility assets in the vicinity. SGN set out to develop an inflatable bag and deployment system that could enable a safer response to such events, speed up the repair and reduce disruption.

The Stent Bag 4"-6“ product developed by SGN, was initially funded through OFGEM’s Network Innovation Allowance (NIA) and aimed to specifically target high volume gas escapes on metallic, medium pressure mains (2bar maximum operating pressure) of 4 and 6 inch in diameter. After testing of the original design it was identified that before rollout and implementation, there were some modifications required.

This project set out to undertake these final elements of the solution for testing.

The Trial

The project set out to undertake the modifications identified, carry out trials and then if successful, undertake training, document outcomes and produce operational procedures. The key deliverables were:

- Modification of product suitable for rollout and implementation.
- Production of four Stent Bags 4”-6”.
- In-house testing to qualify modifications.
- Create training material and supporting product documentation.
- Carry out in-house training.
- Carry out trials in south London depot areas.
- Create operation procedures and documentation.
- Create report outlining work complete.

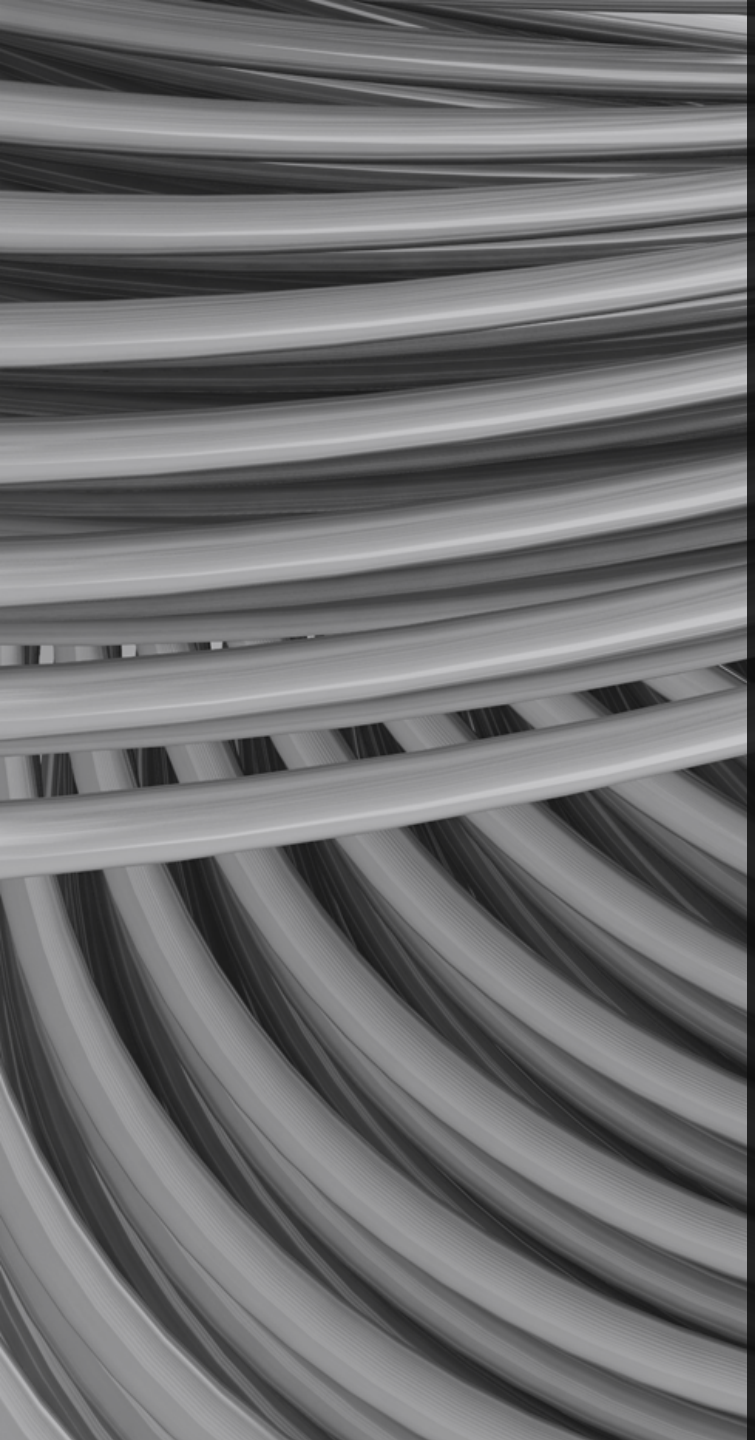
COVID-19 restrictions and alternative ways of working due to this, resulted in minor delays to manufacture and component availability. Additional component items were also identified during the project to facilitate the application of the equipment, although this presented an immaterial impact to the project outcomes.

Outcomes

The final design uses an inflatable stent, along with a camera connected to one end of the device which allows the escape to be identified and the stent positioned, bridging the feature. An access system allows under pressure access into the pipe while containing the pressurised gas. A pneumatic control unit is used to inflate, maintain and deflate the stent while a camera display unit allows vision inside the pipe.

During field testing, the developed prototypes proved that a high volume gas escape could be controlled from within the pipe, resulting in significantly less gas to be released during the application and pipe repair method.

The project has now delivered training and equipment for use in and around London. Due to the nature of these events, they are unplanned and often high impact, however early indications show the equipment will allow for a safer and more accurate response. Reduced repair times within smaller footprints will reduce disruption, while improving safety for both operatives and members of the public. Once deployed, the release of methane to the atmosphere is greatly reduced compared to traditional methods, with limited impact to gas pressure and flow within the network.



Conclusion

The new repair method has now been proven as a viable technology to use when large volume gas escapes occur in London. Further work is being undertaken by SGN that will develop equipment suitable for 8” to 12” diameter metallic medium pressure (2 bar) mains and 90mm to 355mm diameter Polyethylene (PE) medium pressure pipes, with the aim to include 4bar and 7bar in the future. Should the outcome of these developments prove positive, they shall also be shared with both the gas industry and wider road and street works community.

TfL Lane Rental Scheme

Optimising customer journeys through the delivery of safer, innovative and sustainable roadworks

Author

SGN

- Date Created: January 2022
- Email: LaneRentalFunding@tfl.gov.uk