



# Removable Composite Transition Pieces (CTP)

Value Tracking Case Study



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## Background

There are around 300 locations on the National Transmission System where gas pipes pass through reinforced concrete walls, for example into valve pits. Currently, several types of seal are used to prevent contamination by water or soil, but when these seals fail technicians face a major task to fix the problem.

Large scale excavations are required to cut out these seals and allow inspection or repairs to be carried out. The process is time-consuming, high-risk and complex. As assets age, we are likely to need to replace seals more often. Repeated repairs also pose the risk that the reinforced concrete could be weakened creating further challenges for the Operations teams.

## What's new?

The key challenge we faced was how to make the laborious and time-consuming process of cutting away concrete to access the failed seals quicker and safer. The solution lay in the development of removable Composite Transition Pieces (CTP).

Senior Civil Engineer Paul Ogden and his team worked with project partners; Haydale to develop the technique. The innovative seal units can be used to plug the gap between the pipe and the wall. It means that technicians can easily remove the unit and check the pipe for corrosion or damage. The CTP can then be replaced quickly in one simple operation.

## The benefits

Over a period of six years we expect to install about 60 CTPs on the National Transmission System. As Paul Ogden explains, the change will bring dual benefits: "It will significantly improve safety as well as creating savings of up to £13.8 million across the design life of these new assets."

Financially the benefits of installing a CTP are significant especially when viewed over the entire design life of the unit. Without maintenance a CTP unit will be operational for 50 years and by taking less time to inspect once every 10 years savings of £230k could be made over the design life of each installation. This is comparing an inspection using the traditional methods with the composite solution.

Benefits can be tracked after the first inspection and continue for the entire design life of 50 years per unit, this can subsequently be extended further following a simple replacement of the seal around the CTP.

Previously, the method of breaking out concrete, inspecting the seals and replacing the concrete took about three weeks. Instead, thanks to the CTP solution, two technicians will be able to complete the inspection in half a day.

We estimate that 700 fewer hours of 'at risk' activities will be needed for each CTP during its design life. Working on the pit wall requires technicians to work inside a pit which may be several metres deep.

There are also environmental benefits. We calculated that the new approach will save 12 tonnes of carbon equivalent (CO<sub>2</sub>e) for each CTP over its 50-year lifespan. We looked at tasks such as excavating soil to expose the pit wall and generator power needed on site for the duration of the works.



Although the carbon cost for the initial CTP installation is higher than the original method, far fewer excavations are needed over the 50-year lifespan of the CTP. This translates into a significant carbon saving over time.

## Financial savings

To date, the project has saving £63k through new CTP installs with further installs planned and benefits to be tracked.

## Implementation

Two key compressor sites have undergone large-scale works recently. We decided that the new CTPs would be installed at the pit wall transition areas during the new build process. In total, eight new CTPs have been pre-fabricated and will be installed during the construction of the pit wall, further reducing installation costs. These units, along with one that was installed as part of the original trial, will start to provide benefits after their first inspections.

