



## NJUG CASE STUDY

### **CASE STUDY 48: Electrofusion Clamp Detection** *Winner of the NJUG 2010 Quality Award*

The National Joint Utilities Group (NJUG) is the UK industry association representing utilities on street works issues. The 39 companies<sup>1</sup> we represent work to deliver gas, electricity, water and telecommunications to both individual consumers and UK plc.

NJUG members need to continue to drive forward further improvements. We have therefore developed the NJUG Vision for Street Works, which revolves around six main principles:

1. Safety is the number one priority
2. Damage to underground assets is avoided
3. Utilities work together and in partnership with local authorities to minimise disruption
4. Utilities deliver consistent high quality
5. Utilities maximize use of sustainable methods and materials
6. Street works in the UK are regarded as world class

This case study is an example of NJUG delivering on these principles and turning the vision into reality.

#### **Overview:**

Clancy Docwra has developed a practicable solution to an industry wide problem, namely joint failure caused by incorrectly aligned electrofusion couplers. This is frequently a result of the improper use of, or most likely, failure to use pipe alignment clamps.

#### **Case Study:**

Clancy Docwra has developed a system where evidence that a clamp was in situ during the welding process was recorded and if possible prevent the operator from attempting to weld incorrectly.

The solution has been developed to work with the operator and would not impede an operator that observed best practice. An ideal solution would prevent or hinder bad practice, not put an extra onus on the operator in terms of user interaction, record bad practice for training purposes, be robust, reliable and be a cost-effective solution for the business.

The system that has been developed is based on the Polyfuse+ Electrofusion welding system and uses the electromagnetic energy emitted by the fitting during the welding process to enable fitting detection. Because of the behaviour of the energy that is being sensed, the clamp design has been optimised to shield the signal and increase accuracy by only allowing the fitting to be sensed from the sides or from above. The sensor starts by reading background interference before the weld takes place and cancels this out. A further measurement is then taken during the welding process. This signal must be in a specific axial arrangement to the clamp and within its sensing range, typically 6-7 inches. If this requirement is not met the unit suspects a bad joint and aborts the weld. The unit is programmed to lock out if necessary, preventing the operator from further welding until a supervisor unlocks the unit. In any instance the unit will electronically record clamping activity.

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<sup>1</sup> NJUG's current members are Energy Networks Association (representing electricity and gas), Water UK (representing all water and wastewater companies), National Grid, Openreach, and Virgin Media. Our associate members are Clancy Docwra, Skanska McNicholas, Balfour Beatty, Morrison Utility Services, Morgan Est, NACAP, PJ Keary, First Intervention, Carillion, Enterprise, Laing O'Rourke and AMEC. Including members through trade associations, NJUG represents thirty-nine utility companies, and twelve utility contractors.

The system has undergone trials across the business and following return of the trial data where they have found clamp utilisation to be at 98.21% compliant. Board approval has been given for roll-out across the company.

The units will, at operator level, reinforce Clancy Docwra's attitude to quality and best practice.

Because the units can be programmed to lock out and record clamping activity, this can be used as a tool to identify poor workmanship and training requirements. Joints that are welded without proper alignment are a major contributor to joint failure statistics. Using this system helps prevent the operator from making poor quality joints, saving time and money and helping to ensure the quality of the weld.

The data Clancy Docwra retrieve from the welding process now includes clamping data and is their assurance to clients that they are totally committed to quality and current best practice with traceability taken to levels never seen before within the industry.

This unit is totally unique within the industry and has been developed within the Clancy Group in cooperation with Clancy Docwra's suppliers. There is currently a European patent on this design.

Benefits:

Quality Assurance

Ensures Best Practice

Client Surety

Reduced Leakage

Reduced Customer Disruption

Reduced Cost

- Re work
  - Location/noticing/excavation/pipes and fittings/labour/plant/backfill/reinstatement
- Consequential Damage
- Loss of Production

