

EIP012

## Can we better detect HV pre-faults?

### Problem Statement Details

Research has taken place to understand the feasibility of detecting and locating HV defects before they turn into power cuts [Pre-Fix, DFA, Sine post].

There is increasing evidence that online techniques can direct staff to a broadly correct defect location before a protection operation. To operationally exploit this information, a fine-resolution location methodology is required before a repair can be planned.

Because of the intermittent nature of these pre-fault pecks and the variance in the predicted location, use of test-van based techniques might not be the best way to deliver fine location at scale.

Because only small proportions of HV/LV substations benefit from being fitted with line connected current transformers (CT's), approaches that promote on-line measurement of the suspect section will face barriers to scale. There is increasing evidence that the nature of the "pecks" that require detection act between phases (rather than phase to earth) and can be as small as +50 Amps (above base load) for less than one cycle before self-extinguishing.

### Key Stakeholders

Operational teams within NGED. All other DNOs and potentially other utilities.

### Target Market

Operational teams within NGED. All other DNOs and potentially other utilities.

### Enablers and Constraints

It should also be remembered that any proposed techniques will need to be effective on the range of legacy HV cable types, which can include three phase and triplex style cables.

### Scalability and Target Implementation Date

This may be applicable for the entire underground cable network of NGED and all other DNOs. There may be value to other utilities too. Target implementation date of April 2024.

## Innovation Strategy Target Areas

Innovation Theme	Target Area	Primary or Secondary
<b>Data and Digitalisation</b>	<p>The shift to data-driven, digitally-enabled networks is critical as we move towards Net Zero.</p> <p>We need your help to drive standardisation, interoperability, security and digital skills whilst accelerating our transformation to data-driven networks by the mid 2030s.</p>	Not applicable
<b>Flexibility and Market Evolution</b>	<p>Energy networks must quickly and efficiently respond to the rapidly evolving needs of the energy system transition. We need your support to eliminate barriers to new market entrants, deploy novel commercial and network management solutions whilst ensuring fair participation and eliminating regulatory barriers within the RII0-2 price control periods.</p>	Not applicable
<b>Net zero and the energy system transition</b>	<p>In order to meet the UK net zero targets of 2050 we must start converting our networks to deliver low carbon fuels today. We want to work with you to develop the role of our gas networks into the future by investigating, trialling, implementing and delivering safe, low carbon alternatives to natural gas such as Hydrogen.</p> <p>Net Zero requires connection of more low and zero carbon sources of energy generation, storage and demand to both the transmission and distribution networks. We need your innovative methods for effective network management and accessing flexibility to improve visibility, forecasting and modelling of low carbon technologies.</p>	Secondary
<b>Optimised assets and practices</b>	<p>Innovation has a key role to play in ensuring our networks continue to remain reliable, safe, secure and resilient to our changing climate. We are constantly looking to improve and welcome support to identify methods to prevent interruptions, ensure resilience, reduce climate impact and future-proof our networks.</p>	Primary
<b>Supporting Consumers in Vulnerable Situations</b>	<p>Equality and fairness are the foundations of a just transition to Net Zero. We hope you can provide insight into the transient and situational nature of vulnerability and how we can overcome the impact the energy system has on consumers, building strong relationships for the future.</p>	Not applicable
<b>Whole Energy System Transition</b>	<p>The energy system must consider the full range of opportunities, risks and interdependencies that exist across the energy networks to integrate and optimise them in a way that best serves the consumer. We are looking for ways to improve visibility of the networks and transitional options, co-ordinate approaches and collaborate across the UK.</p>	Not applicable