Innovation Basecamp 2026

4th February 2026 – Park Plaza, London

EIP152: Retrofitting Fluid-Filled Cables to Prevent Environmental Leaks

Introduction

National Grid Electricity Distribution (NGED) and UK Power Networks (UKPN)

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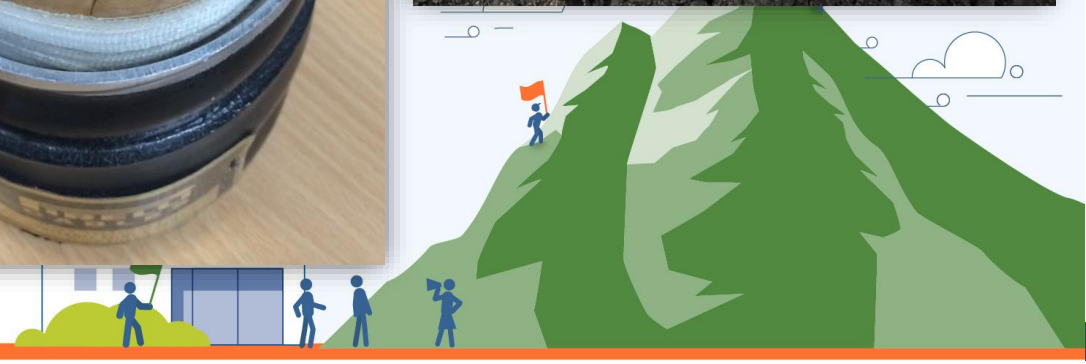
Background Information

- **Fluid Filled Cables:**
- **Background:**
  - Installed 1930s – 1970s
  - Voltages from 33KV – 400KV
  - Initially insulated with mineral oil then Linear Alkyl Benzene (LAB)

- **Scale:**
  - NGED ≈700KM
  - UKPN ≈ 2260KM
  - All UK DNOs and TOs ≈6300KM
  - Average pressure: between 4-70psi
  - Overlay costs (at £1M/KM) ≈£6.3BN



What are the Problems?

- **Cables leak due to:**
  - Ageing
  - Physical damage
  - Soil or ground condition
  - Leaks occurring after decommissioning

- **Causing:**
  - Environmental harm
  - High clean-up costs
  - Negative effects on reputation, regulatory compliance, and legal standing

Pollution

Millions of litres of oil seeping into UK soil from ageing electricity cables

FOI requests reveal leaks beneath cities, residential areas, riverbeds and fields in 'huge problem for environment'

Jasmine Owens

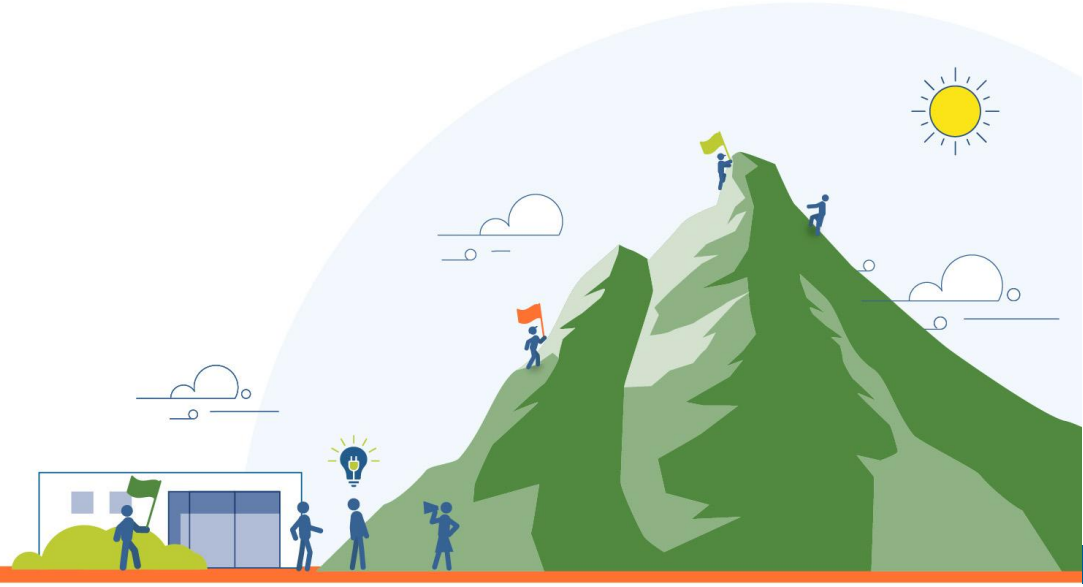
Wed 13 Aug 2025 12.50 BST

Problem Statement

"How might we retrofit existing fluid-filled cables to eliminate or neutralise their dependence on oil, while maintaining electrical performance, reliability, and safety, at a lower cost and with less disruption than full replacement?”

Past innovation projects:

- Self Sealing Cable Fluid (in development)
- Cable Pressure Variability
- Bacterial Decommissioning
- Leak Location (PFT)



What are we looking for?

Retrofit legacy underground cables to reduce pollution risk and accelerate net-zero goals

Is risk elimination achievable?

- Can the cable *fluid be replaced with an alternative medium* that maintains cable integrity while removing the risk of leaks and environmental damage?

- Ideally, during operation, or if not, at the time of decommissioning

Key criteria:

- **In Service:**
  - Meet or exceed in-service standards at lower cost than an overlay
- **At decommissioning:**
  - be economically feasible and outperform existing alternatives

Key Contacts:

- **For further information / clarity:**
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- **ANY QUESTIONS?**

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