

INSIGHT - Innovative Network Status Intelligence Gathered by Holistic use of Telemetry

INSIGHT is looking for solution providers!

We want to work with suppliers of power system monitoring and management systems to:

- Evaluate and improve oscillation detection/mitigation systems using our real-time testing/development environment.
- Create an integrated solution that makes the best use of monitoring equipment and systems that are already deployed.

Please get in touch and sign up for our Webinar on 29th February or 8th March: sifprojects@sse.com



The Challenge

The UK Government's Net Zero strategy to decarbonise the power system by 2035 means the volume of renewable generation on the network will increase massively. Inverter-based resources (IBRs), e.g. wind and solar, introduce new dynamics compared to traditional fossil fuel driven synchronous generation. System instabilities that manifest as power system oscillations have occurred, presenting severe threat to the security of the system

INSIGHT aims to address this issue by delivering a real-time alert and control system that monitors and mitigates different types of power network oscillation events.

The Solution

The INSIGHT project will monitor, classify, and manage new forms of system instability on a network dominated by IBRs.

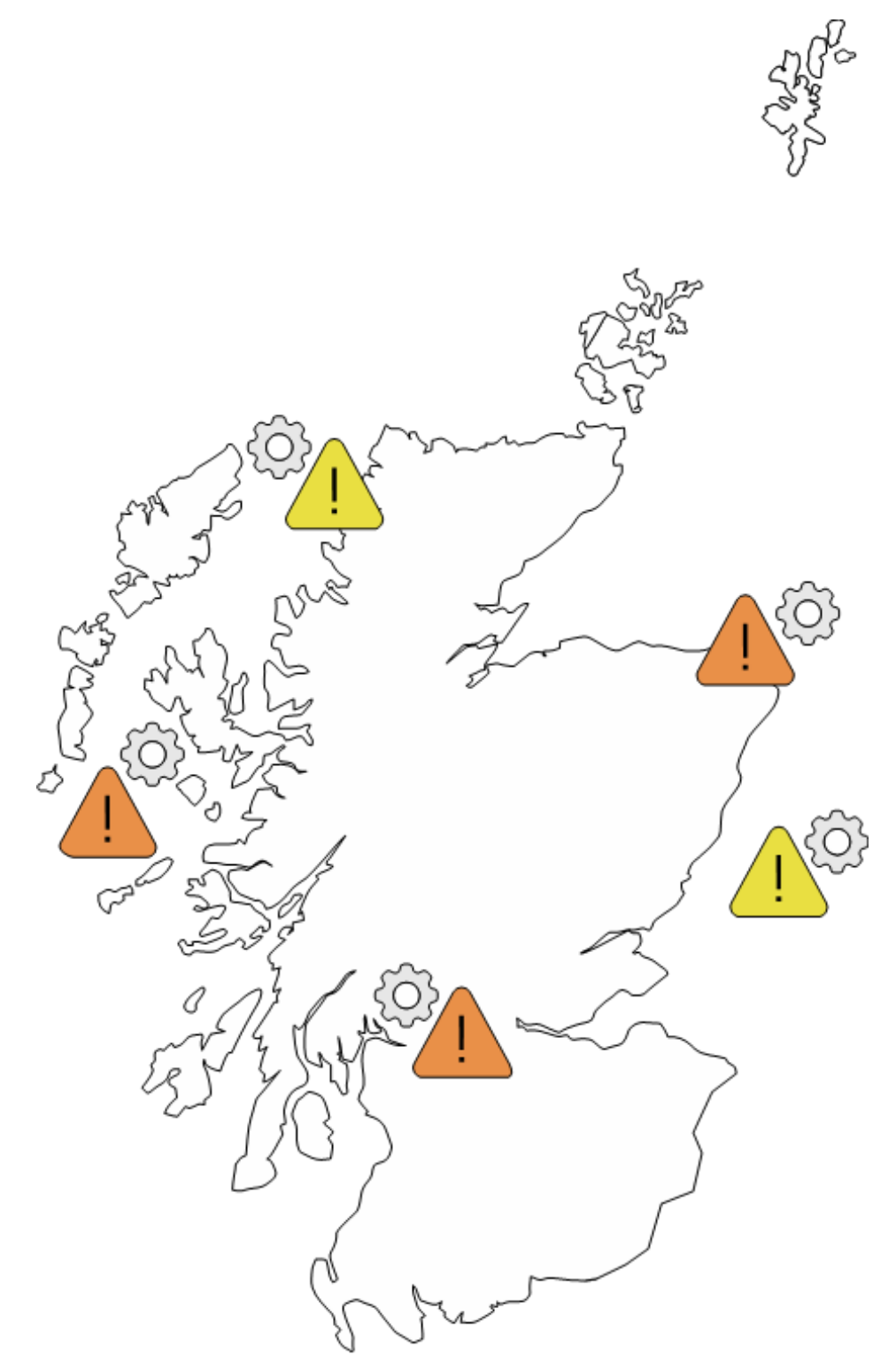
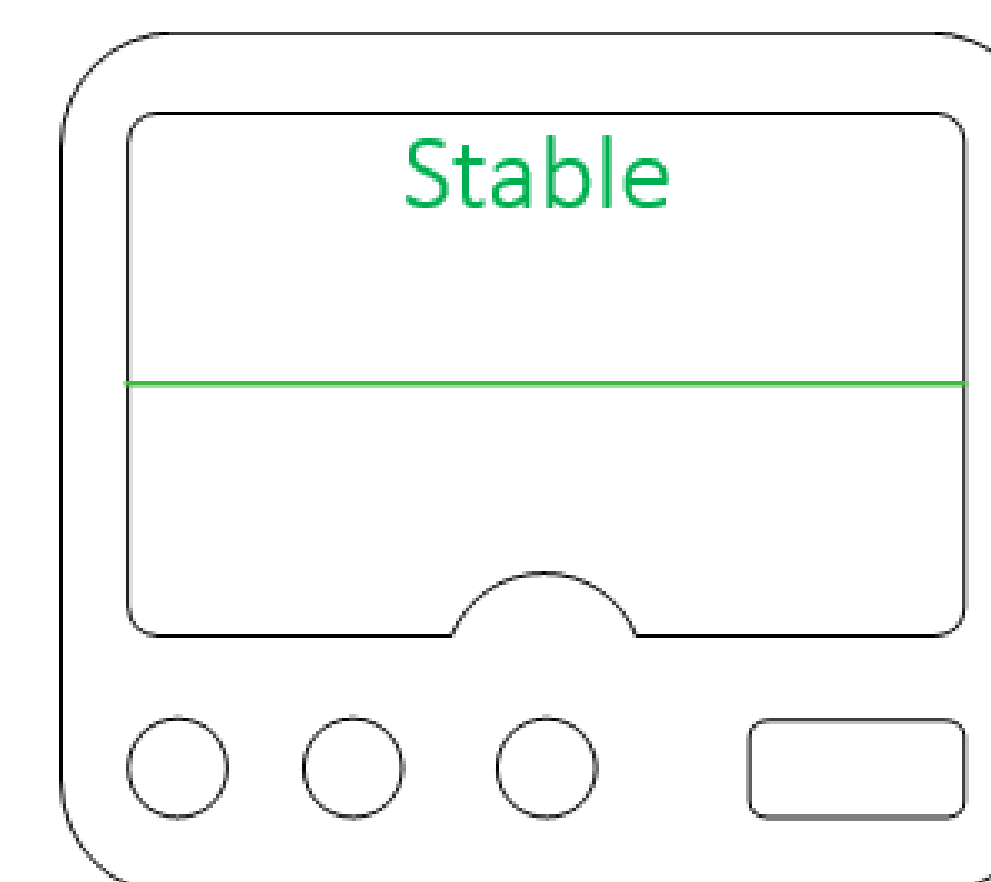
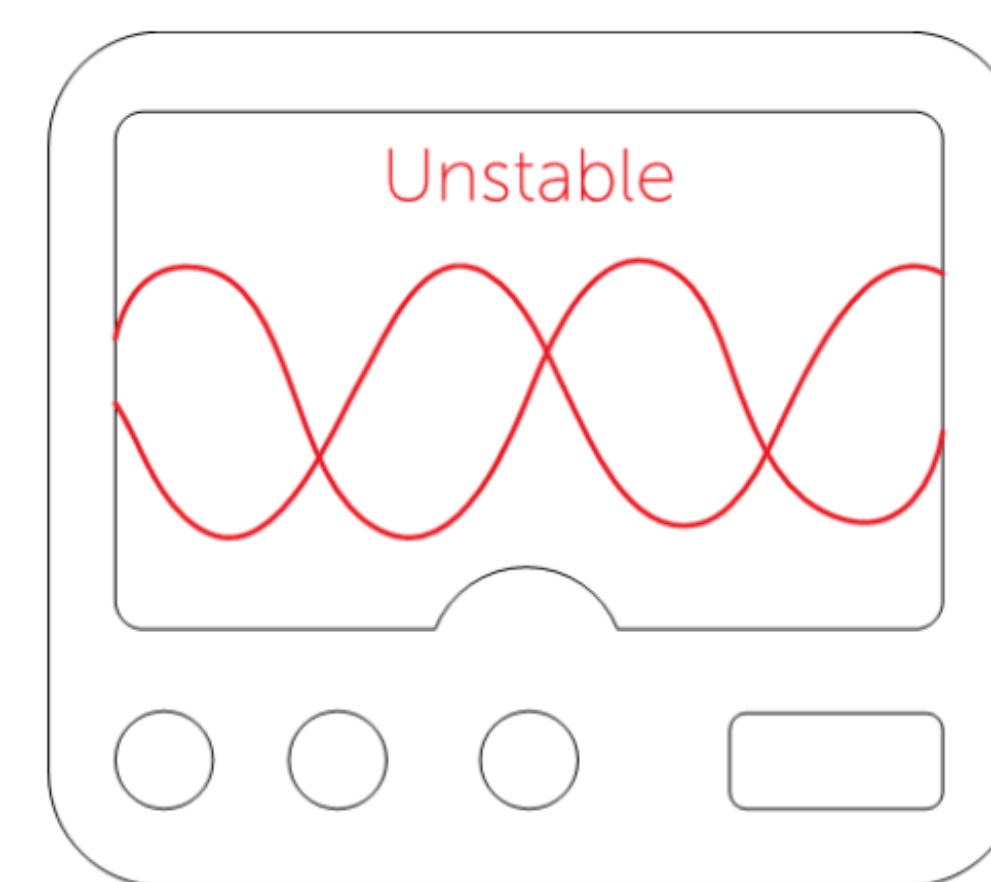
The project will combine learnings from past oscillation events with new modelling and simulation techniques to better understand the nature of these new oscillations and how to detect and address them in network design and operation for future events.

A key part of the solution will be to build upon previous innovative work that focused on system stability dominated by power electronics covering:

- Modelling and simulation of IBR rich networks and power system oscillations
- Identifying and trialling technology solutions for monitoring and mitigating oscillations
- Implementation of real-time oscillation monitoring platform within the GB network

Oscillation Management

Monitor ► Detect ► Interpret ► Mitigate



Innovation

INSIGHT aims to develop an innovative technology that proactively identifies and classifies an oscillation's risk to the network and provides real-time corrective recommendations to the control room and operations. This is an advancement of current practices across the world where post-analysis is the norm.

Instability risks to the transmission network related to new phenomena are not underpinned by normal practices and analysis, therefore there is an insufficient understanding within the networks about how to detect or mitigate them. Proactive identification and classification, combined with new standards and codes to support the management of these oscillations, represent new areas of analysis, tools, systems, and processes not yet available to Great Britain nor developed comparably elsewhere.

INSIGHT
Webinar sign up



Benefits of INSIGHT

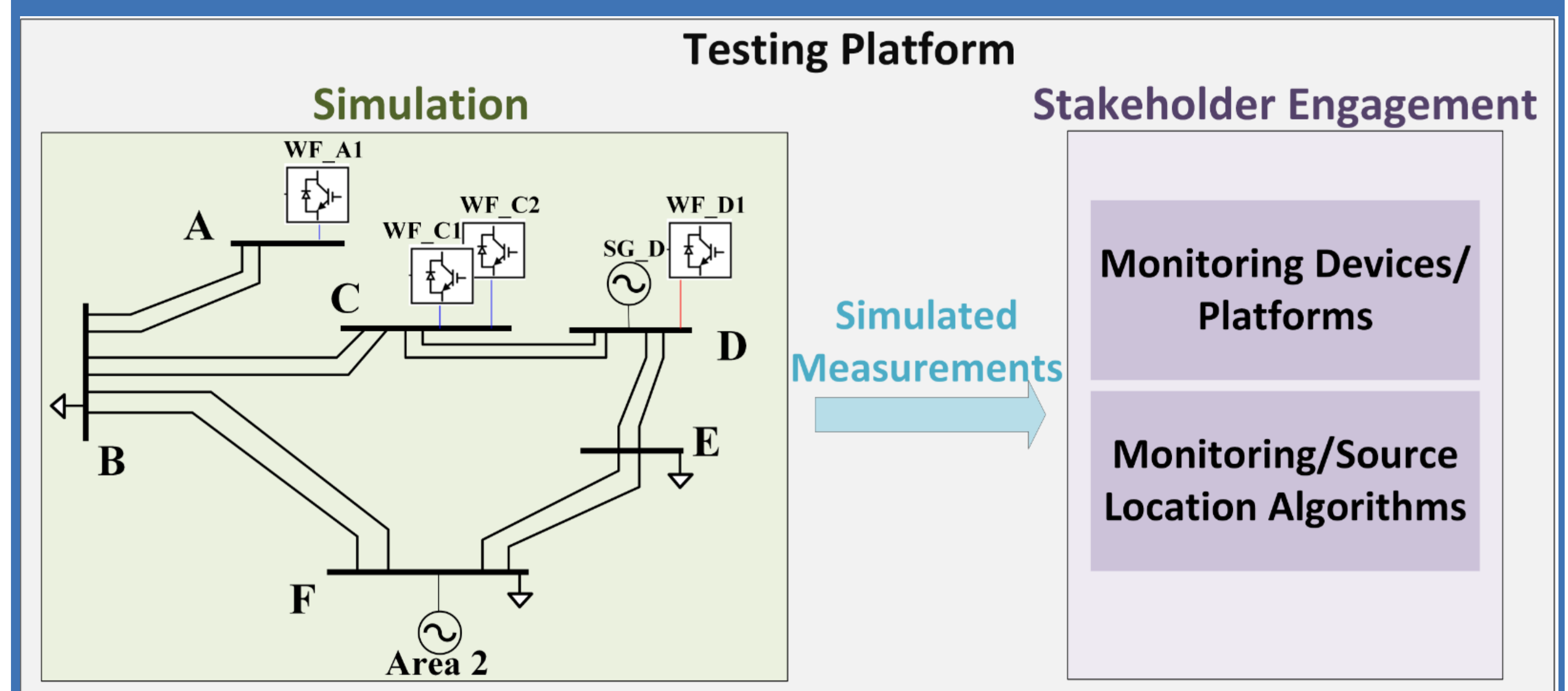
INSIGHT project provides benefits by providing a tool for the system operator to reduce system instability risks that does not involve the costly installation and running of synchronous plant. The current method of managing oscillations on the system is to increase the strength of the system by changing the generation dispatch and/or restrict the taking of major system outages. This strategy is expensive to the Consumer who foots the bill for the balancing mechanism cost for the UK network.

The **financial benefit** of INSIGHT will ultimately be measured through a reduction in balancing costs incurred by the Electricity System Operator. The availability of tool to manage emergent system issues will provide a large risk reduction for network operation and planning going into the future.

There is an **environmental benefit** in the form of carbon reduction. Balancing actions normally means carbon-based sources of generation are utilised to balance the system to manage oscillations. INSIGHT will reduce CO2 emissions by providing technology to predict and mitigate system instability in real-time, thereby, negating or reducing the need to use carbon-powered synchronous generators.

Approach - Realtime Simulation & Hardware-in-the-Loop

- Representative model for replicating real-world events
- Evaluation, development, and validation of new monitoring, analysis & control solutions



For more information, contact:

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