



**Electricity  
Distribution**

# **EIP119: Substation Flood Alarm Systems**

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**nationalgrid**



# Contents page

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**01** Problem & Background

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**02** Expectations

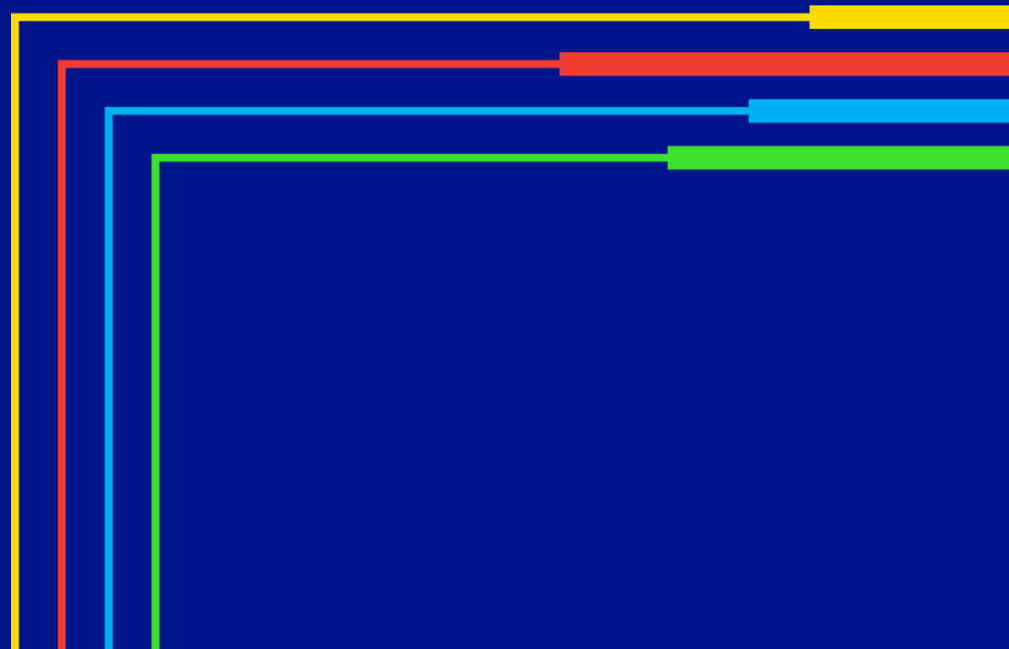
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**03** Contacts

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# 01

## The Problem



# EIP119: Background

## Engineering Technical Review 138: Resilience to Flooding of Grid & Primary Subs



### Flood risk assessment undertaken, flood defences installed

Flood defence measures include:

- Elevating equipment
- Purpose designed flood walls to surround existing buildings
- Use of higher transformer bunds (must be coupled with suitable pumping arrangements to avoid rain water build up)
- Use of higher structures
- “Tanking” and duct sealing of buildings together with provision of pumps
- Permanent site perimeter protection walls / barriers, together with provision of sufficient portable pumps
- Relocation of site in very exceptional circumstances



# EIP119: Problem

- The severity and frequency of extreme flood events are projected to increase due to climate change.
- UKCP18 projects increases in daily and hourly rainfall.
- Future rain events will lead to increased pluvial (surface water) and fluvial (river) flooding.

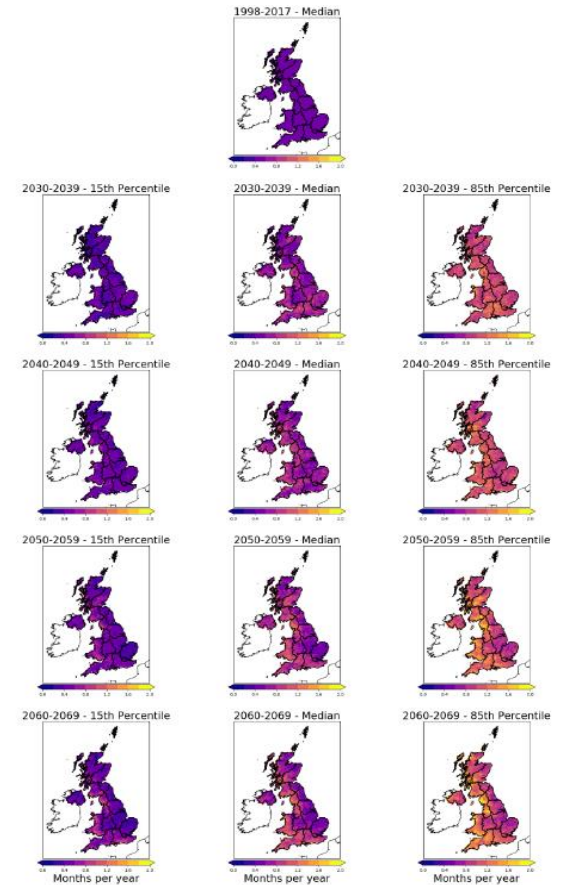
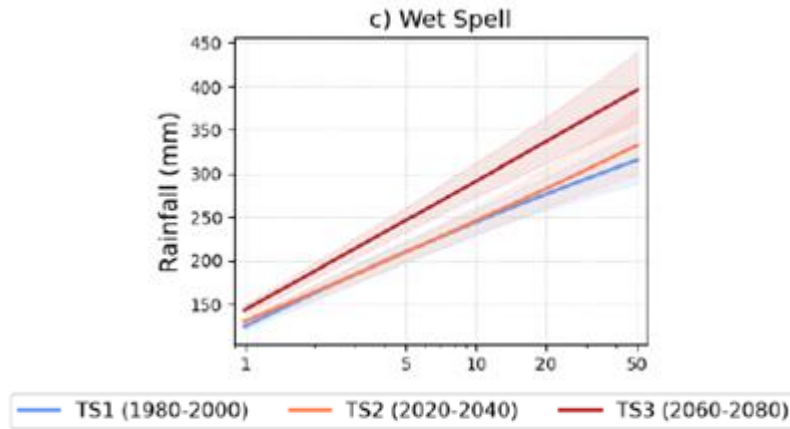


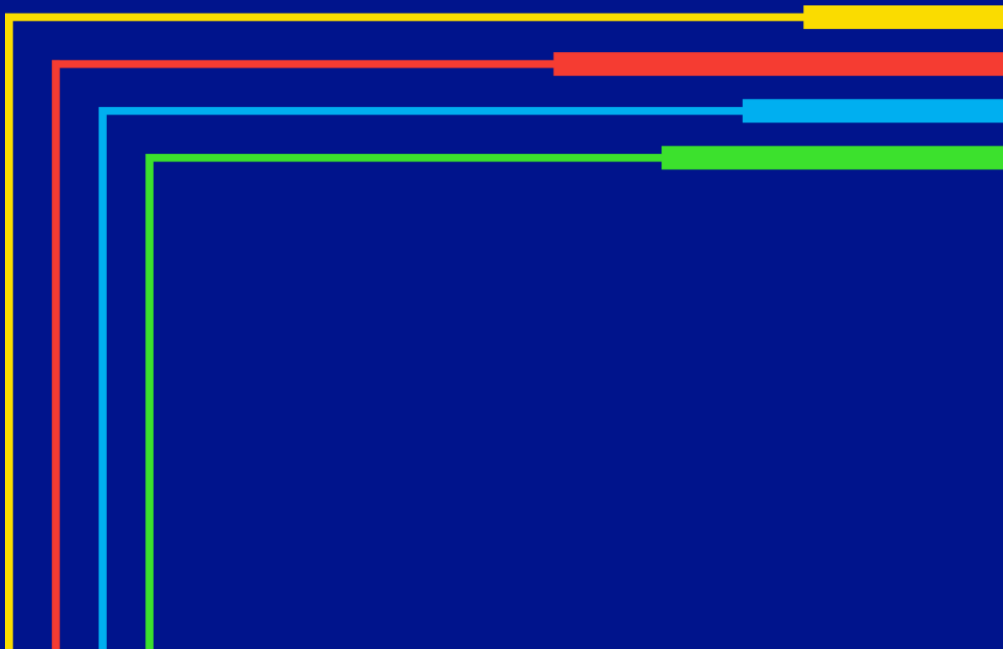
Figure 17: Number of months per year rainfall exceeds 95<sup>th</sup> percentile of monthly rainfall in today's climate under RCP8.5.

# EIP119: Problem

- Existing flood defences can be breached due to increased flood levels leading to uncontrolled shutdowns - resulting in Customer Interruptions and unnecessary Customer Minutes Lost.
- Site access and monitoring rising flood levels can be dangerous for field staff.
- Switching operations can be difficult due to flood waters covering the local area and required switching points.
- Uncontrolled shutdowns (fault trips) can cause equipment damage with high repair costs.

# 02

## Expectations



# EIP119: Solution Expectations

The solution must;

- Remotely monitor water levels in electricity distribution substations during flooding events
- Have a functionality for multiple stages to trigger automatic disconnection/sequence switching
- Have communications link with control for visibility/being able to integrate with current SCADA systems
- Physical configuration of the device can be easily adoptable to specific conditions of the substations
- Risk analysis for automatic switching is expected to be included in the scope of the project
- Knowledge of the current flood response policies is essential (national and NGED specific)



# EIP119: Similar innovation projects

## Automated Weather Alerts Tool – NGET Asset Resilience

NGET are looking to install water level sensors for real time data.

The NGED idea is for a more advanced system with more interaction with control systems and operational capabilities.

### Flood Forecasting

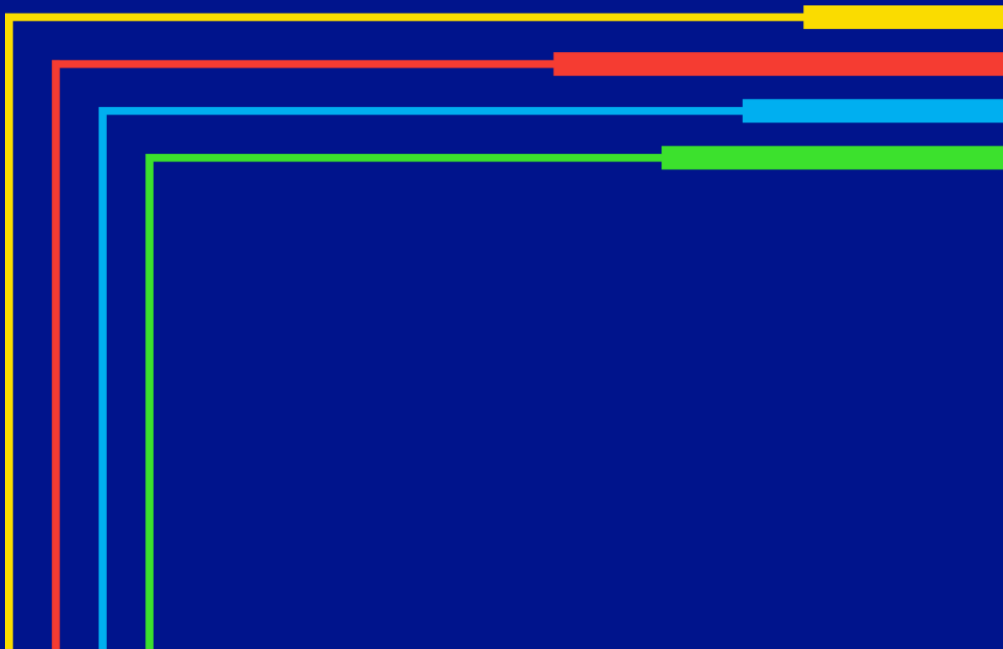
- Unique flood nowcasting and forecasting for NGET asset locations including fluvial and surface water flooding
- Bespoke Sensor installations in strategic locations and real-time data

PREVISICO



# 03

## Contacts



# Contacts

## New Connections

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