

A satellite with large solar panels is shown in space, with the Earth's horizon visible in the background.

Safeguard your assets, keep an eye on the grid!

How can we optimise our assets and practices through innovations?

Thomas Jackson (SGN) & Arnaud van den Berg (Orbital Eye) – EIS Liverpool, October 31st, 2023

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orbital
eye



SGN
Your gas. Our network.




**Energy Innovation
Summit**

Introduction

 *How can we **optimise** our assets and **practices** through **innovations**?*

 ***Satellite-based grid monitoring!***

 Orbital Eye provided it's satellite based monitoring solution 'COSMIC-EYE' to SGN & NGT during 2023

Today's presentation:

- Introduction Orbital Eye & COSMIC-EYE
- COSMIC-EYE for SGN & NGT
- COSMIC-EYE for SGN: project details
 - Overview
 - Examples of detections
- Value of CE for SGN & UK grid operators

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Orbital Eye - Company Overview



Founded in Delft in 2012



Serving customers worldwide



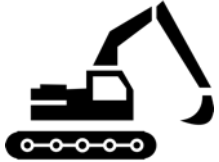
Providing satellite-based monitoring services for network operators



Increasing safety along critical infrastructure in a sustainable way



COSMIC-EYE - Background



Largest cause of damages in energy corridor are Third Party Interferences (TPIs)



Energy grids often cover large areas, expensive to monitor frequently



Monitoring and controlling TPIs reduces number of incidents

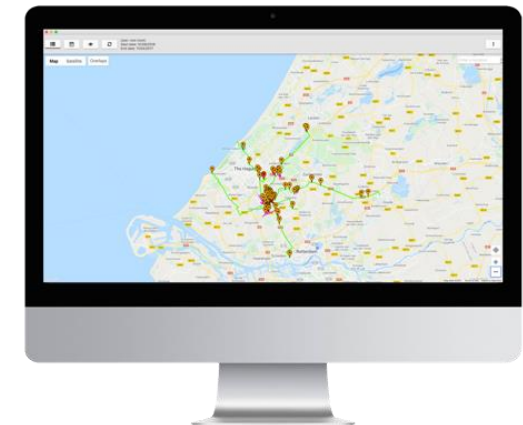


Current monitoring methods unsustainable, unreliable, and expensive



Example of a TPI next to a gas pipeline

Solution:
COSMIC-EYE



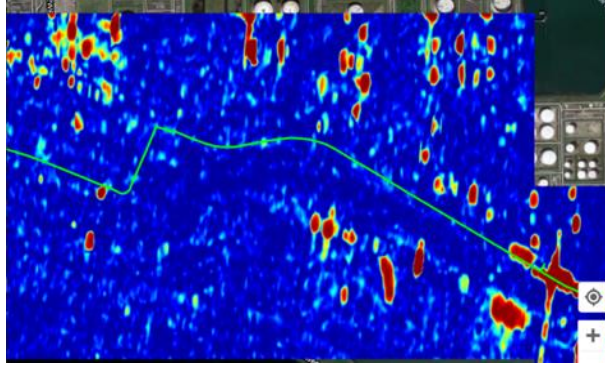
COSMIC-EYE – How it works

Collect satellite data for corridor



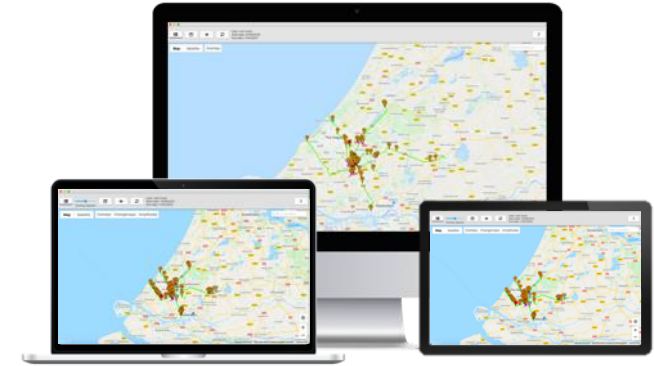
- Weather Independent **Radar** satellites
- **Multispectral** satellites
- **High-Resolution Optical** satellites

AI-assisted data analysis



- Analysis of satellite data to **detect Third Party Interferences** in the corridor
- **Irrelevant activities** are filtered out

Easy-to-use application



- **All detected, relevant, TPIs** are reported in the **COSMIC-EYE app**
- Along with **optical images** for **location of interest**
- Available for **desktop and mobile**

COSMIC-EYE for NGT and SGN



Two COSMIC-EYE demonstrations in the UK through Strategic Innovation Fund



Demonstrations were recently concluded



Demonstrations showed that COSMIC-EYE can add value to monitoring procedures of UK network operators

NGT – North East England

Map showing the COSMIC-EYE demonstration route in North East England. The route is marked with a green line and numerous red pins indicating detected TPIs. The map includes a search bar and navigation controls.

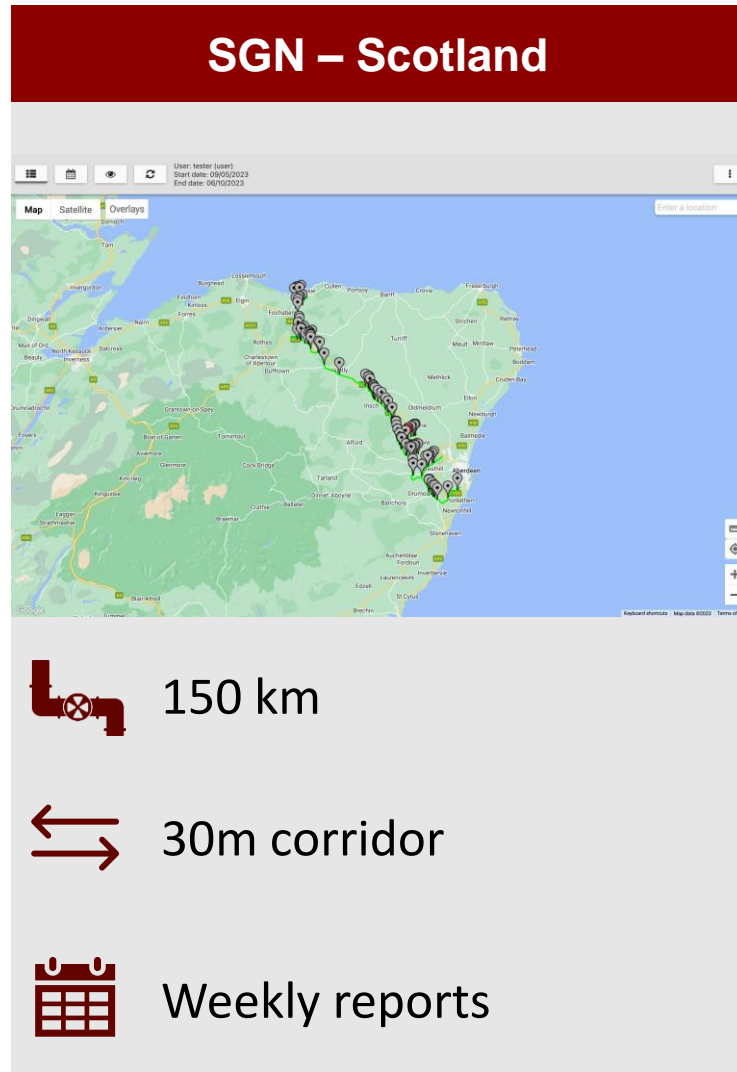
- 140 km
- March 2023 – Sep 2023
- ~ 100 TPIs detected

SGN – Scotland

Map showing the COSMIC-EYE demonstration route in Scotland. The route is marked with a green line and numerous red pins indicating detected TPIs. The map includes a search bar and navigation controls.

- 150 km
- April 2023 – Oct 2023
- ~ 120 TPIs detected

COSMIC-EYE for SGN: project overview



Goals of the COSMIC-EYE demonstration

- SGN is looking for sustainable and cost-effective pipeline monitoring solutions
 - Previous satellite-based monitoring solutions were not suitable
 - COSMIC-EYE on paper filled 'missing pieces' → COSMIC-EYE demonstration
- COSMIC-EYE was evaluated by SGN on multiple aspects:
 - Accuracy and Reliability
 - Coverage and Flexibility (in different weather conditions)
 - Ease of integration and user satisfaction

Key take-aways

- COSMIC-EYE is able to detect many relevant events, in all weather conditions
- Committed and enthusiastic project participation at SGN
- An optimized COSMIC-EYE system can fit into SGN's operational monitoring procedures

COSMIC-EYE for SGN: detected activities

- Ongoing works close to SGN's pipeline
- COSMIC-EYE allowed SGN to monitor progress of works over time

Optical images available in the COSMIC-EYE application show the progress of works over time



July 2022 – area is vegetated



April 2023 – ground works taking place



June 2023 – monitoring of ongoing works

COSMIC-EYE for SGN: detected activities

- Demonstration showed that COSMIC-EYE needed optimisation for SGN
- Below activity was detected by COSMIC-EYE but not reported: outside >30m corridor
 - Reported by SGN as 'missed event'
- Optimisation: activities encroaching towards corridor should be reported as well



July 2023 – no works visible



September 2023 – trucks visible close to the PL
but >30m away



September 2023 – On-site picture of the roadworks

COSMIC-EYE for SGN: detected activities

- COSMIC-EYE was able to detect multiple relevant activities around SGN's pipeline
- However, there were a number of instances where relevant events were missed by the system
- Main reasons for not detecting activities included:
 - Detection algorithm in need of further optimization
 - Short or small events (challenge for any monitoring method)

Value of COSMIC-EYE for SGN & other UK grid operators



Reliable

COSMIC-EYE performance only slightly affected by weather conditions



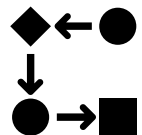
Sustainable

Satellites have zero emission and there is no risk of flight incidents



Efficient

Only areas where activities take place need attention from operator



Easy-to-Use

The Orbital Eye team ensures a seamless integration of COSMIC-EYE



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