



WHEN TRUST MATTERS

# ALLIANDER REDUCES AVERAGE INTERRUPTION DURATION (SAIDI) BY 2.14 MINUTES

Over 2,000 Smart Cable Guard systems significantly  
improve grid reliability





# KEY BENEFITS



Faster fault repairs saving thousands of lost customer minutes each time



More effective maintenance scheduling and use of maintenance resources



Visibility on the health condition of 6,000 kilometres of PILC, XLPE and mixed cable systems

## ABOUT THE CUSTOMER

Alliander is one of the largest distribution network operators in the Netherlands, serving over three million electricity customers. It manages an electricity grid of 92,000 kilometres, including around 40,000 kilometres of distribution cables. The company's mission is built on three pillars: reliability, affordability and accessibility. Alliander has been a key partner in the development and launch of DNV's Smart Cable Guard.





## THE CUSTOMER CHALLENGE

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Alliander's customers need to be able to rely on the continuity of their energy supply - 24 hours a day, 7 days a week. To meet this need, Alliander strives to avoid planned and unplanned energy outages as much as possible. Any faults in its extensive distribution network could leave hundreds of thousands of people without power. At the same time, however, the Dutch power system is making increasing use of renewable energy such as solar and wind power. While this is essential to meet climate goals, the intermittent nature of these sources can cause fluctuations in the load carried by the distribution cables, impacting temperature and pressure and potentially leading to weak spots and faults.



## DNV's SOLUTION

Smart Cable Guard is a 24/7 online cable monitoring platform for electricity distribution networks. It provides real-time alerts of short-circuit faults and partial discharge activity that could cause weak spots and develop into faults, pinpointing their location to within 1% of the cable length. In 2017, Alliander installed 64 Smart Cable Guard systems covering 240 kilometres of distribution cables as an initial trial. The systems were installed at various places on the network to monitor different lengths and types of cable. They monitored the cables for breakdowns, intermittent faults and partial discharges that indicate a weak spot.

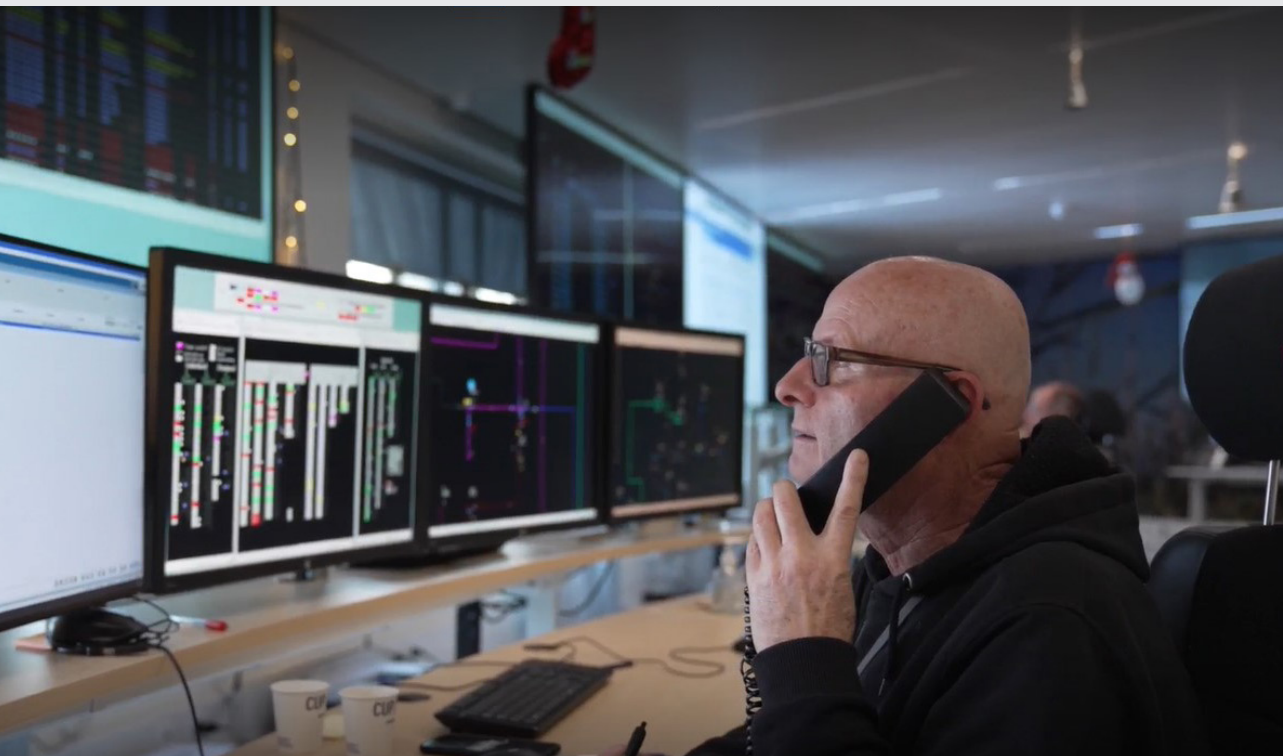


Smart Cable Guard proved itself capable of pinpointing faults and intermittent faults to within 0.1% of the monitored cable length – even better than its performance target of 1%. Moreover, Alliander believes Smart Cable Guard prevented nine partial discharge-based outages during the trial, avoiding over 400,000 lost customer minutes.

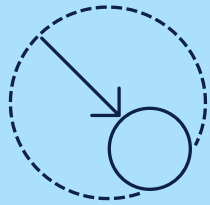
Based on these excellent operational results and a positive business case evaluation, Alliander decided to rollout Smart Cable Guard more widely to about 25% of its medium voltage (MV) cables. By the start of 2023, over 2,000 systems had been installed on Alliander's distribution network, monitoring more than 6,000 kilometres of PILC and XLPE cables and systems combining both types – including cables up to 13 km long. A further increase to about 3,000 systems is planned in the near future.

## BENEFITS TO THE CUSTOMER

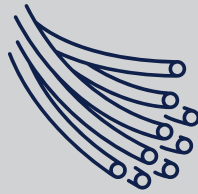
Smart Cable Guard has two functions: preventing faults based on Partial Discharge (PD) activity and bringing back power faster through accurate real-time cable fault location. At Alliander, Smart Cable Guard is used in different types of MV-cables and replaces traditional Fault Passage Indicators. This way, the real-time cable monitoring platform helps reduce both The System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) for the Dutch utility.



Since 2017, Smart Cable Guard has prevented over 200 failures in Alliander's network. With the wider rollout, SAIDI was reduced by 2.14 minutes in 2022, by preventing 58 cable related failures (-1.53 minutes) and shortening outage duration in 189 cases (-0.61 minutes), due to real-time fault locating. Out of these 189 failures detected by Smart Cable Guard, 75% occurred outside of the circuit monitored, but were still picked up thanks to the algorithm.



Reduction of  
SAIDI by  
**2.14 minutes**



**6,000**  
**kilometres**  
of cables measured



**> 2,000**  
**systems**  
installed



**> 200 failures**  
prevented since  
2017

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One of our strategic pillars is excellent grid management by utilizing existing assets. Implementing Smart Cable Guard was the foundation to enable us to implement meshed operations and other innovative operational management concepts.

*Denny Harmsen,  
Consultant Innovation System Operations,  
Alliander*





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