

The business case for flood-resilient MV joints

Reducing outages, protecting assets and lowering total cost of ownership

Introduction

Flooding, rising groundwater levels and extreme weather events are no longer isolated incidents for medium-voltage (MV) networks. For many utilities, they represent a structural operating condition that directly affects reliability, maintenance cost and public perception.

While technical discussions often focus on cables, field experience consistently shows that failures under wet conditions are concentrated at joints and accessories.

This document translates joint reliability into business impact. It explains how flood-resilient joint design reduces outages, limits repair interventions and supports a lower total cost of ownership (TCO) for MV networks.

Why joint failures drive outage cost

When an MV joint fails under flooded conditions, the consequences extend far beyond the failed component itself. Joint failures typically result in:

- unplanned outages
- emergency repair activities
- extended restoration times due to excavation and drying
- repeated interventions at the same location

Because joints are embedded underground, access is costly and disruptive. In flood-prone areas, repair conditions are often difficult, further increasing labour, safety and coordination costs.

As a result, even a small number of joint failures can dominate outage statistics and maintenance budgets.

Flooding changes the cost profile of MV networks

In dry operating conditions, marginal differences in joint performance may appear acceptable. Under flooding, those differences become decisive.

Moisture ingress that would otherwise remain benign can trigger degradation mechanisms that lead to delayed failures months after the flood event. These delayed outages are often harder to

diagnose, increasing troubleshooting time and repeat interventions.

From a cost perspective, flooding shifts the network from predictable maintenance to reactive recovery, with higher operational expenditure and lower asset availability.

Why prevention is more effective than recovery

Repairing joints after failure addresses the symptom, not the cause. If the underlying joint design is not suited for sustained water exposure, the same location may fail again under similar conditions.

Flood-resilient joints reduce cost by preventing:

- water ingress under hydrostatic pressure
- degradation at interfaces that leads to delayed failures
- repeated excavation and reinstatement work

Preventive investment in robust joint solutions typically has a higher upfront cost but significantly lowers lifetime expenditure by reducing the frequency and severity of outages.

Impact on asset lifetime and replacement planning

Joint failures often shorten the effective service life of surrounding assets. Moisture-initiated degradation can spread to adjacent cable sections, accelerating ageing and increasing the likelihood of secondary failures.

By maintaining sealing integrity and electrical stability under wet conditions, flood-resilient joints help preserve the designed lifetime of the network.

For asset managers, this translates into:

- fewer premature replacements
 - more predictable renewal planning
 - better alignment between technical lifetime and financial depreciation
-

Grid resilience and stakeholder confidence

Beyond direct cost, joint reliability under flooding affects broader performance indicators.

Frequent outages reduce customer confidence and increase regulatory scrutiny, especially in urban or critical infrastructure areas.

Resilient joints support faster recovery after extreme weather events and reduce the probability of cascading failures.

In networks supporting renewable generation, where assets are often located in exposed or low-lying areas, reliable joints are essential to maintain availability and protect investment value.

What decision-makers should focus on

From a business perspective, flood-resilient MV joints should be evaluated on:

- proven resistance to long-term water exposure
- stability of sealing and adhesion after ageing
- reduction in outage frequency and repair interventions
- contribution to predictable operating cost over the asset lifetime

These factors directly influence TCO and should be considered alongside traditional capital cost comparisons.

Conclusion

Flood-resilient MV joints are not just a technical upgrade; they are a strategic investment. By preventing water ingress and delaying degradation, robust joint solutions reduce outages, lower maintenance and repair costs, and protect asset lifetime. In flood-prone environments, joint reliability is a key lever for improving total cost of ownership and long-term grid resilience.

Continue exploring

On the main page, you can explore technical insights into joint design for water-logged areas, along with practical selection criteria that help translate reliability requirements into specification and procurement decisions.