

The combined impact of mid-term asset management and system development on reliability of supply

Challenge and objective

- Several things influence how the risk with respect to reliability of supply may develop over the next years and decades, for instance: 1) component ageing, 2) component renewal and other mid-term asset management measures, 3) load growth, and 4) grid development.
- How do these influence the risk prognosis?
- What is the combined effect of mid-term asset management and system development?
- How may system development decisions influence mid-term asset management decisions and vice versa? In other words, what are the interactions between these decision processes?

What have we learned?

- Allowing the load demand in the system to increase without/before reinforcing the grid makes the system more vulnerable to condition-dependent transformer failures.
- The system operator can combine the uncertainty information in the risk prognosis with its risk preferences.
- System development decisions such as increasing grid capacity and connecting new loads has a significant impact on the risk prognosis. This impact is more sudden and can be greater than the impact of degradation and mid-term asset management decisions.
- The choices made for system development decisions thus impact what is the best choice in asset management decisions.
- How long outage duration one expects greatly impacts the best time for replacing the transformer. A higher outage duration means that the transformer should be replaced earlier.

Implications and recommendations

- Mid-term asset management decisions should be made in accordance with the future system development alternatives. Correspondingly, system development plans should consider the needs of the existing assets and mid-term asset management decisions.
- In other words, it is beneficial to consider system development and mid-term asset management decisions together.
- Using common analysis methods and common sets of input data for the risk prognosis make decision making more consistent across mid-term asset management and system development

