NEPLAN®
Smarter Tools

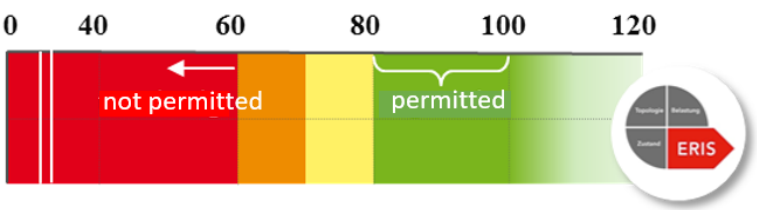
What value does your security of supply have?

The operation of a lean, supply-safe network is becoming increasingly important for grid operators. The importance of quantitative assessment of supply security is increasing. With ERIS (Evaluation of Reliability Index for Electric Systems), you receive an ideal tool for network planning and development as well as for the systematic determination and measurement of supply security during operation.

The task of a network operator is to operate a reliable and at the same time efficient network. These two objectives must be weighed against each other for an optimal state of affairs. Particularly with regard to future requirements for the integration of electricity from renewable energy sources in combination with load development, ERIS helps to quantify the security of supply. ERIS can also be used to measure the impact of expansion and renewal investments. This way, investments can be planned in a targeted and timely manner based on the desired level of supply security. The ERIS quality score is also suitable for comparing network variants and for evaluating or optimizing target network planning. With ERIS we support you to increase the efficiency of your networks and increase the profitability of your business.

Giving security of supply a value

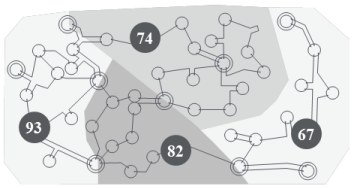
ERIS gives security of supply a value that can be used for the targeted network and the renewal planning. ERIS is a non-uniform number between 0 and 120, whereby 120 corresponds to an ideal network. If a network variant has a value greater than 100, the security of supply is above average (overcrowded). Conversely, ERIS values below 80 require action. A value less than 60 is not permitted.



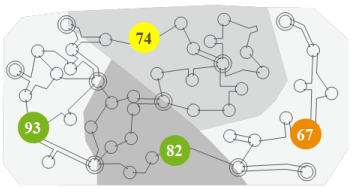
The ranges result from the set planning principles. This allows you to define your specific supply security requirements. Adjustable planning principles include, among other things, the maximum permissible line load or the targeted proportion of the switchgear systems that are better than (n-1) connected.

With ERIS you can:

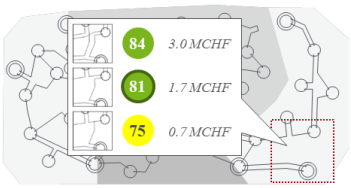
- ✓ Measure the security of supply



- ✓ Recognize the need for action

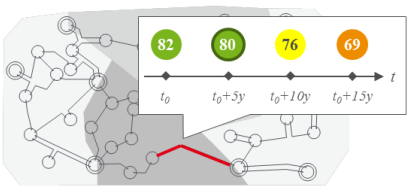


- ✓ Compare variants

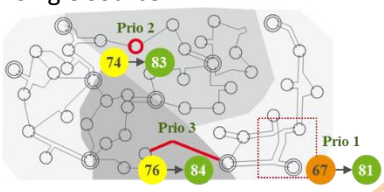


- ✓ Place loads depending on the expected development

- ✓ Define the time of renewals

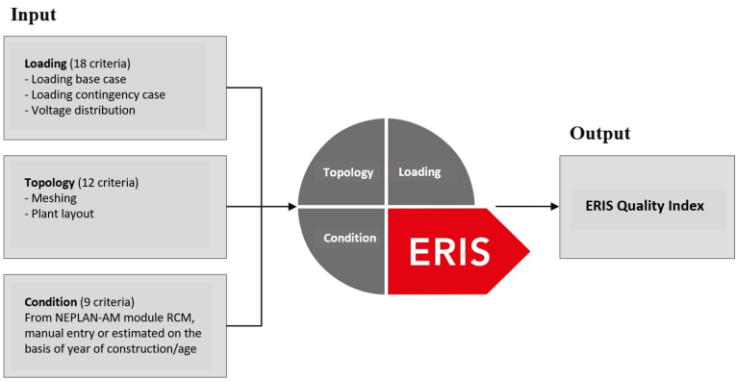


- ✓ Prioritizing network expansion and renewal measures from a single source



Comprehensive evaluation methodology

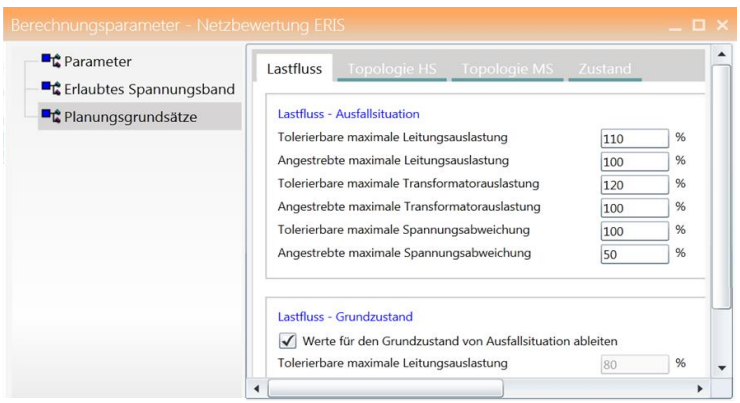
The assessment is based on the three main categories of loading, topology and condition. This means that all network-relevant criteria for the evaluation of a network or subnetwork are taken into account.



Firstly, node voltages and element loads in the base case and the failure situation are calculated to evaluate the load by means of load flow and failure calculations. In the case of radial-operated grids, possible optimal re-supply switching is also taken into account. The calculation results are then compared and evaluated with the permissible voltages and loads.

Secondly, the network topology is evaluated. For this purpose, the degree of meshing per node, calculated from the number and length of the supply lines, as well as the switchgear layout (double busbar, length separation, etc.) are taken into account.

Thirdly, the status per device is imported from the NEPLAN AM RCM module or another asset management tool via the existing interface for status evaluation. Alternatively, the states per element can be defined manually or estimated on the basis of the respective age/construction year. ERIS evaluates the overall state of the network or subnet from the states per element.



Case study

When building new switchgear, the question arises as to whether a supply transformer is sufficient. The ERIS calculations for a variant with one transformer and a variant with two transformers and three different load developments provide information on this:

The variant with one transformer has an ERIS value slightly below the target range between 80 and 100 with a strong load increase of 79. 104%, which is above the target value of 100% but still significantly below the maximum permissible value of 120%, is due in particular to the maximum transformer utilisation in the failure situation.

Since a decreasing load development is expected in this region, a transformer is sufficient in this switching station. In order to be able to react flexibly to changed load developments, the space in the system layout is kept free for the installation of a second transformer.

NEPLAN AG Power System Engineering
Oberwachtstrasse 2, CH 8700 Kusnacht, Zurich
Phone +41 44914 36 66
www.neplan.ch
Info@neplan.ch