WEIDMANN KNOWLEDGE SERVICES
TRANSFORMER FLEET & CONDITION ASSESSMENT

- Understand and rank the condition of a transformer fleet
- Identify 'high risk' areas and vulnerabilities in your network
- Receive clear action items to better manage your transformer lifecycle program
- With 'remaining transformer life calculations', understand the future of your asset
- Schedule and invest in maintenance based on condition, not time
- Determine future capital expenditure requirements

Capturing 140 years of transformer insulation and technology experience in the Weidmann ARRO fleet assessment tool, to provide our customers with the most accurate and comprehensive fleet assessment program available today.

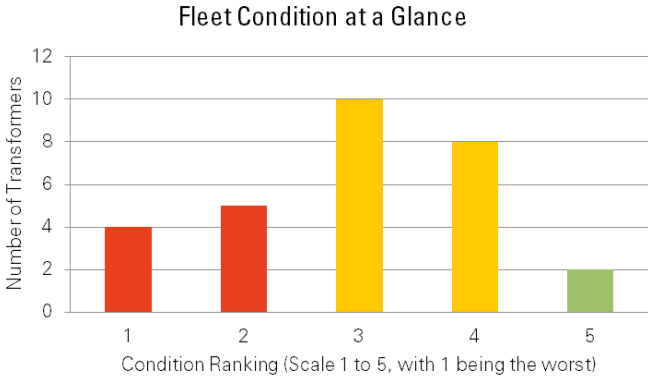
Transformers are a critical part of the energy delivery system. They form the backbone of the network, and in order to ensure system reliability, it is essential that transformers are operated optimally, with minimum risk of failure or unplanned outages. The Weidmann fleet assessment tool, ARRO, is a unique platform combining Weidmann's extensive knowledge regarding transformer breakdown and condition, along with utilizing global standards to ensure consistency in data across the fleet.

It is not always the oldest transformer in the fleet that requires the most attention. With Weidmann's ARRO fleet assessment tool, we use your data to create a detailed overview of which transformers pose the highest threat to network stability, and additionally guide the operator to invest maintenance budgets exactly where it is required.

PROGRAM 1: ADVANCED FLEET ASSESSMENT

The information which is taken from your existing test data and history from each transformer in an identified fleet is entered into the ARRO data analytics platform. The ARRO platform incorporates global standards such as IEEE, IEC, and recommendations from CIGRE, combined with algorithms developed by Weidmann engineers using our extensive experience of transformer analysis.

The data is then presented in a report that ranks the condition of the assets in your fleet based on health and condition calculations. Additionally, clear data is provided to guide the operator regarding investment of maintenance and future capex budgets.



Example of a fleet assessment chart

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PROGRAM 2: TRANSFORMER CONDITION ASSESSMENT

Often when reviewing an advanced fleet assessment, a transformer operator will receive, for the first time, a true picture of where risk exists across a fleet of transformers. Having this information enables the operator to ensure that risk mitigation plans are put in place through increased maintenance schedules or a change in decommissioning plans etc. However, it is often determined that additional information is required on these critical, high risk assets, and Weidmann's detailed transformer condition assessment can support you.

Key to understanding the overall health of a transformer is determining the condition of the insulation. As the inventor of Transformerboard and industry thought leader, present on most international standards committees, why would you trust anyone else to determine the condition of your assets?

A transformer condition assessment focusses on a single asset. The data received from the advanced fleet assessment is used as a starting point to determine key areas of focus. Electrical tests are performed on the transformer including bushings and on-load tap changers, which are used to further explore potential issues. Using the test data as a reference, Weidmann's experienced engineers provide analysis and further review to determine not only the key issues, but where possible, the root cause and rectifying action required.

Along with serving to further investigate issues raised in the advanced fleet assessment, the condition assessment also looks deeper into the transformer condition, uncovering other topics that could contribute to the health and remaining life of the asset.

RECOMMENDED ELECTRICAL TESTS TO BE PERFORMED ARE:

- Power factor tip up test at 2 kV
- Power factor (at operating and variable frequency), at 10 kV
- Bushing power factor operating and variable frequency
- Exciting current
- Leakage reactance
- Turns-ratio
- Winding resistance
- Sweep frequency response analysis (HV OC, LV OC, and HV SC tests)
- Dielectric frequency response
- Frequency response of stray losses

RECOMMENDED TESTS ON AN OIL SAMPLE TO BE PERFORMED ARE:

- Dissolved gas analysis
- Dissolved metal-in-oil analysis
- Moisture content
- Dielectric breakdown strength
- Power factor at 25 °C and 100 °C
- Acid number
- Interfacial tension
- Color analysis
- Visual analysis
- Furan analysis
- Particle counts
- Inhibitor content

Weidmann offers a comprehensive platform of products and services that enable improved lifecycle management of transformers. For more information, please visit: www.weidmann-electrical.com.

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