

Exclusive Release

Transformers Fleet Monitoring based on Centralised Oil Test Results

by Motwane



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by

Motwane



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Transformers Fleet Monitoring based on centralised Oil Test Results

Motwane Digital:

The MOT-WARE captures data from a full range of BLE-enabled Motwane testing equipment. It is accessible from web-based, desktop and mobile application. In addition, it offers an open architecture that can seamlessly integrate with any non-Motwane test and measurement equipment for quick and authentic digital test data. The data can be captured periodically as well as streamed in real-time via sensors from the loX'n Series of IoT devices.

Some of its features include a pre-loaded repository of test templates for various assets as well as customizable test templates. A Customized Report Builder in MOT-WARE allows users to generate reports that can be designed and generated as per their desire. MOT-WARE also has the facility to upload test data history and break-down history of assets. Tests can also be viewed by various metrics, such as pass/fail.

Data analysis done through MOT-WARE includes trend analysis, MIS reports, and pivot tables.

Motwane's Oil Test Kits consist of OTS-A series for measuring Oil Breakdown Voltage with Bluetooth connectivity feature and MOT-WARE mobile app for remote access to testing data and storage in the cloud for further analysis and record purposes.

Centralized data storage for Fleet of Transformer

- Smart Digital Transformation of Testing Practices.
- Upgradation from offline testing practises with a connected solution.
- Fleet Assessment of oil test data for prioritisation of critical asset.
- Cloud storage of historic test data.
- Condition assessment of the critical transformer.
- Trend analysis, MIS report, and Pivot Tables.
- Meta data analysis for the correlation of offline and online parameters.
- Fleet data can be used for further diagnosis using big data, AI analytics, and trend analysis.
- Selecting the Best-Performing Make.
- Selecting the Best-Performing Oil Type.

General Current Practices

- Offline storage of fleet testing data.
- There is no fleet analysis for prioritising critical assets.
- Offline testing practises are mostly followed.
- Reactive maintenance practices.
- Unplanned Shutdown due to Critical Transformer Failure.

- inefficient operation of the transformer with unmonitored oil quality.
- Poor oil quality material and testing devices with non-connectivity features.
- No historic data is stored in records.
- No test fleet analysis for effective utilisation of oil.

Barrier/problem we are trying to solved

- Fleet test data management.
- Authentic data collection through connected devices and the digital MOT-WARE platform.
- Customized report creation through MOT-WARE.
- Proper manpower utilisation and asset management for the fleet of transformer.
- Optimized Productivity.

Selecting critical transformers for urgent attention to mobilise the maintenance team

Year	Tx	Make	Oil Type	BDV (KV)
2021	T1	A	Easter	75
2021	T2	A	Mineral	32
2021	T3	C	Mineral	56
2021	T4	A	Silicon	65
2021	T5	B	Silicon	58
2021	T6	B	Easter	72
2021	T7	B	Silicon	66
2021	T8	C	Mineral	38
2021	T9	B	Easter	71
2021	T10	A	Easter	72
2021	T11	A	Silicon	64
2021	T12	A	Mineral	62
2021	T13	B	Mineral	53
2021	T14	C	Mineral	31
2021	T15	C	Mineral	44
2021	T16	B	Silicon	59
2021	T17	B	Mineral	48
2021	T18	B	Mineral	30
2021	T19	C	Mineral	55
2021	T20	C	Mineral	53

Table 1.1 Transformer Oil BDV value Comparison

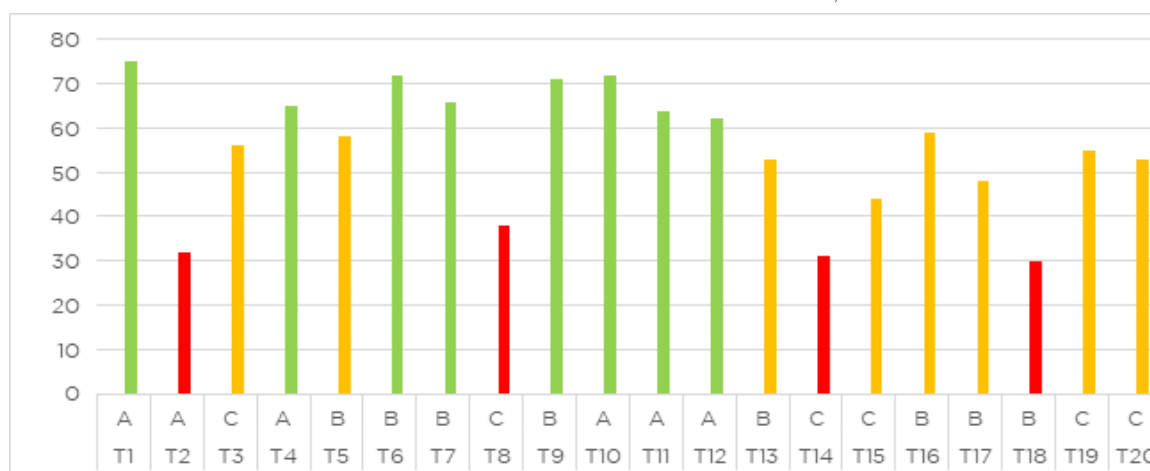


Chart 1.1 Bar Graph of Transformer Oil BDV Values

- Transformers T2, T8, T14, and T18 are critical and need close monitoring.
- Transformers T3, T5, T13, T15, T16, T17, T19, and T20 have average health requirements and must be monitored on a regular basis.
- Transformers T1, T4, T6, T7, T9, T10, T11, and T12 are all in good working order.
(Selecting Critical Transformers for Immediate Attention in order to mobilise the maintenance team)

Selecting Transformer Make Based on Performance

Make	Critical	Average	Healthy
A	1		5
B	1	4	3
C	2	4	

Table 1.2 Transformer Make Comparison

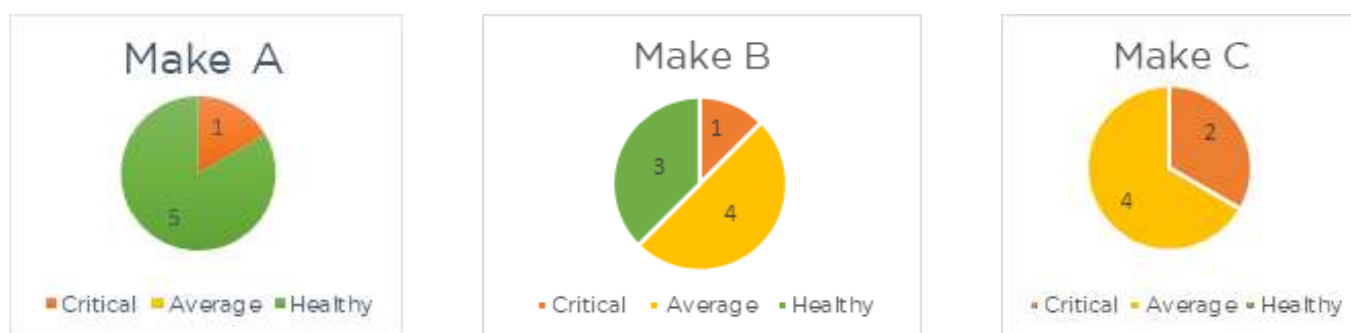


Chart 1.2 Transformer Make Comparison

The above pie chart depicts Oil status (Healthy, Critical, Average) instances for 20 Transformers, which can be help to select best make for the transformer with good Oil performance.

Make A have the healthiest instances and least critical instances of Oil BDV values. Make 3 performance was observed to be very poor with respect to other 2 makes.

Selecting Oil Based on Performance.

Oil Type	Critical	Average	Healthy
Easter			4
Silicon		2	3
Mineral	4	6	1

Table 1.3 Oil Type Comparison

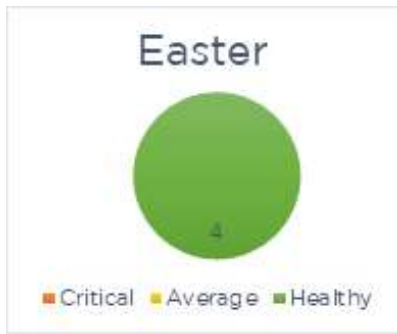


Chart 1.3 Oil Type Comparison

The above pie chart depicts Oil status (Healthy, Critical, Average) instances for 20 Transformers, which can be help to select best performing Oil type for the transformer.

Easter based Oil type has the healthiest instances for Oil BDV values. Mineral oil performance was observed to be very poor with respect to Easter and Silicon based Oil type.

Hence, such analysis is possible through Motwane oil testing equipment, which can help in monitoring fleet of transformer.

Our Transformer Oil Testing Equipment

Features



Oil Breakdown Voltage Kit
(60/80/100 kV)

- Fully automatic microprocessor based
- Pre-programmed international test standards
- Customized test sequences
- Upgraded sequence as per IEC 60156-2018
- Suitable to test minerals, ester & synthetic oils
- Internal memory of up to 100 tests
- USB interface
- In-built thermal printer
- Voltage checker for onsite calibration
- Bluetooth enabled for MOT-WARE mobile app

Features



Oil Tan Delta & Resistivity Kit

- Dissipation factor , Volume Resistivity, Dielectric Constant (Permittivity), Watt loss
- Oil test heating chamber with precise Temperature control
- Test cell according to IEC 60247
- Pre-programmed & customized Test sequences
- Inbuilt Thermal Printer
- Internal Memory for 250 Test
- USB Interface
- Portable calibrator
- Oil Auto drain facility
- Bluetooth enabled for MOT-WARE Mobile App

For enquire on our products reach to us at sales@motwane.com