



# TIMSA

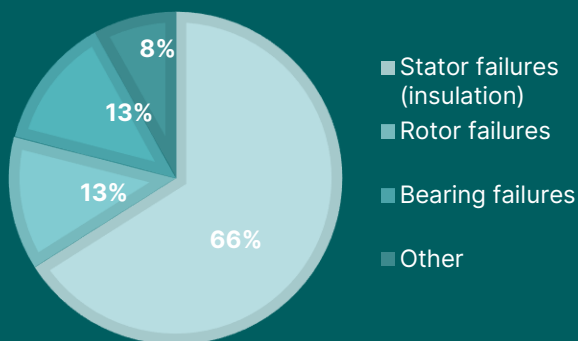
## Test and Inspection for Machine Status Assessment

An advanced inspection protocol to mitigate the risk of failures on MV/HV rotating machines

### Proactive inspection scheme

Rotating machines have an increased risk of failures while aging. Comprehensive and proactive health inspections are a boon to safeguard from such failures. We developed a detailed inspection protocol with a deeper focus on rotating machine stators. This could enable you to schedule better-planned maintenance, prolonging the lifecycle and minimizing unforeseen outages.

Motor failures - 4 kV and greater



### How do we do it? Here's an overview!

Dedicated electrical and mechanical tests will be performed, and test results analyzed. Based on the results, an action plan will be recommended to fix any issues proactively. We recommend a full TIMSA electric protocol that can be complemented with several optional mechanical tests.

### Mechanical (optional)

#### Bearing inspection

Bearings will be opened, then surface and clearances will be checked for proper running.

#### Vibration analyst

Stator will be checked for wearing issues due to vibrations with actual vibration pattern.

#### Bearing oil checks (includes PMG when present)

Overall service condition of bearing oil and antifriction greases will be checked and analyzed (antifriction grease will be replaced, if required).

### Electrical

#### Internal visual inspection or borescope

Experts' visual assessment on winding and core health.

#### Recording and analysis of operating data

Operating data such as voltage, current, temperature, vibrations etc. will be measured and analyzed.

#### Insulation Resistance test (IR)

Winding to ground resistance will be checked by grounding the motor frame and imposing a DC voltage on unit windings.

#### Polarization Index (PI)

Insulation polarization rate will be measured to determine dryness and cleanliness of windings.

#### Dielectric Discharge (DD)

Aging and deterioration of stator insulation will be diagnosed, via insulation discharge pattern.

#### RLC Measurement

Any variation of RLC measurements of the windings versus the as-built measures is investigated.

#### Step Voltage (SV)

Increasing steps of voltage will be applied to insulation, as per IEEE43 §6.4 standard. Results will give indication on overall insulation condition.



## Surge test

Inter-turns surge test is conducted following IEEE522 standard. It will apply a fast rise time voltage peak between each phase, then comparing the waveforms obtained.

## Partial Discharge (PD) measurement\*

Winding's response to specific stress levels will be checked and its future performance will be predicted accordingly. Continuous Online PD monitoring and Data Interpretation is also available.

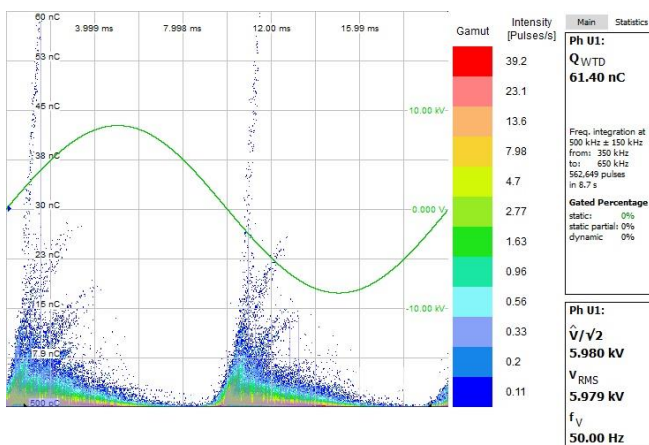
## Dissipation factor ( $\tan \delta$ ) measurement\*

Stator winding's insulation quality will be evaluated.

\* Tests excluded on machines <4kV

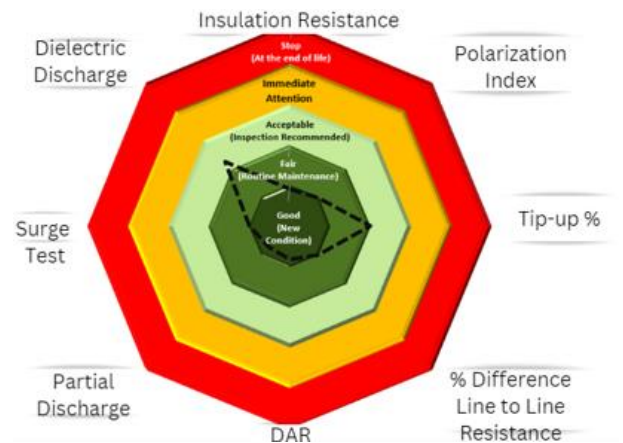
## HIGHLIGHTS

- Applicable to all induction, synchronous & DC units.
- Power Conversion recommends TIMSA at every major outage (or dry dock, for marine units).
- Electrical tests will require our Field Service Engineer to work at your site for 1-2 FSE day/machine. Mechanical checks will require 2-4 days extra, based on unit size and tests included.



## Sample analysis - TIMSA diamond

TIMSA Diamond is a simplified snapshot of key rotating machines electrical indicators. Comparing the latest diamond with previous helps understand deeper the stator health evolution.



## Benefits

- A detailed inspection and analysis performed by Power Conversion experts to identify the potential problems well in advance.
- An action plan, along with the evaluation report recommended by Power Conversion experts, to fix any problems identified.
- Critical spares list recommended for immediate recovery of the system from unexpected breakdowns.
- Customers empowered to select tests to be performed based on their unique site conditions.
- Reduced service costs and operating risks while increasing asset reliability.

## Contact us:

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