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Wta Urges Industry To Maintain Transformers

Transformers have often been referred to as one of the most efficient pieces of equipment developed by mankind and, as this apparatus has limited moving parts, majority of individuals believe it to be maintenance free.

There could be nothing further from the truth, according to Andre Mans, COO of WEG Transformers Africa (a division of Zest WEG Manufacturing), who says getting optimum performance and a long functional life from this essential asset is contingent on having a comprehensive preventative maintenance and service strategy in place.

“Preventative maintenance of transformers is critical not only from an operational reliability perspective but also because a well-structured maintenance programme will significantly extend the life of the transformer. In most cases it is not inconceivable for a well-maintained transformer installation to have a lifetime that outstrips that of an average human,” Mans says. “This could between 40 to 50 years.”

Custom support programmes

WEG Transformers Africa (WTA) offers a suite of support services for its transformers customer base and these include preventative maintenance programmes that can be structured to accommodate customer needs and/or budgets. Mans stresses that it is, however, most important for customers to do an initial assessment of the transformer installation as this will allow a base line to be verified and following any corrective action a customised support programme can be implemented to ensure the optimum reliability of the transformer.

During a preventative maintenance assessment, WTA’s team of skilled technicians will rate the transformer according to the application in which it is being used. Following this, a needs-based maintenance strategy is implemented with the objective of reducing the probability of transformer failure.

“We are able to provide verifiable reporting on the condition of the transformer using oil sampling, analysis and thermal graphics surveys, all of which meets international quality standards reporting requirements and are accepted by most insurance,” Mans says.

“Our maintenance strategies are customised for each installation to track the asset condition and enable verifiable reporting on performance degradation. Preventative maintenance can provide an early warning mechanism as it provides crucial information that could facilitate an early intervention with major servicing or even component replacement,” Mans continues.

On-site preventative maintenance

Transformer oil sampling is carried out by skilled individuals to ensure accuracy and reliability. The manner the sample is taken is critical to the result and sampling tins are only used once to avoid cross contamination.

When drawing the oil sample, the sampling technician will also do a visual external inspection of the transformer against a checklist as this will pick up any physical issues with the transformer. Evidence of leaks or a change in colour of the silica gel will be a clear indication that there is moisture ingress. The general condition will also give an indication of corrosion.

In addition to the visual assessment and oil sampling and analysis, the WTA team undertakes thermal graphic surveys to determine areas where excessive heat may be present in the transformer and other electrical equipment.

All information is accurately documented to ensure it can be compared against new information from subsequent follow-up on-site condition monitoring inspections.

WTA oil sampling laboratory

One of most important differentiators for the WTA customer base is that the operation has a fully-fledged oil sampling laboratory at its facility in Heidelberg. According to Mans, it is considered by industry as the best privately run laboratory in the country.

Samples are brought back to this laboratory where state-of-the-art equipment and international best practice is used to analyse the oil. The oil sample is compared to a base line and this enables the technicians in the laboratory to identify potential problems which cause transformer failure.

The Karl Fischer titration procedure (moisture parts per million (PPM)) is used to determine the moisture content of the oil. High moisture will result in dielectric breakdown .

The oil is analysed to determine where Polychlorinated Biphenyl (PCB) is present because of the high risk factor associated with exposure to this substance and the potential risk should it catch fire. The PCB test is done to identify whether the oil contains PCB, and if so the amount.

Furanic analysis is also done and this determines the cellulous breakdown products in the oil and gives an indication of the life expectancy of the insulation in the transformer.

Other tests include kV or dielectric strength testing to determine the insulating properties and DGA dissolved gas analysis, which provides a clear indication of internal failure conditions. Acid levels are also checked against acceptable standards.

Follow up interventions

Following the comprehensive oil analysis, WTA's mobile field service teams are able to implement interventions to address identified issues. These interventions could include anything as basic as re-torqueing the transformer to replacing gaskets and cone rubbers right up to major on-site repairs including replacing offload tap changers.

Significantly, the WTA field service teams operate from fully equipped vehicles with all the necessary tooling as well as 4 500 litre per hour high vacuum purification unit. These skilled technicians are able to do the most basic physical inspection to full on-site repair work.

"We are one of few OEMs that can offer this level of support to industry and on-going training ensures that our team is kept abreast of technology as well as operational skills such as working at height, fire fighting and HV regulations," Mans says.

Other maintenance activities done on site deal primarily with the condition of the transformer and could entail purification and regeneration as well as vacuum treatment being done to eliminate entrapped air.

Oil samples are taken after all inventions to gauge the success of the intervention.

Verifiable reporting

All work done by the WTA laboratory is documented and customers receive a before and an after report.

“This maintenance of an historical database is essential as it allows the accurate tracking of the condition of an individual transformer and it also allows identification and investigation of trends that may develop in individual transformers,” Mans says.

“By having experienced OEM technicians do regular surveys on transformers to assess their operational health, it is possible to mitigate against any potential risk in terms of asset failure,” Mans concludes.

TRANSFORMER MAINTENANCE PIC 01 : Andre Mans, chief operations officer of WEG Transformers Africa.

TRANSFORMER MAINTENANCE PIC 02 : WEG Transformers Africa undertakes on-site oil purification.

TRANSFORMER MAINTENANCE PIC 03 : Preventative maintenance is critical and will extend the life of transformers. WEG Transformers Africa offers custom support programmes.

TRANSFORMER MAINTENANCE PIC 04 :On-site oil purification of a transformer in progress.

TRANSFORMER MAINTENANCE PIC 05 : WEG Transformers Africa customises support programmes to suit customer needs.

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