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ZEST ENERGY INVESTMENT IN TECHNOLOGY RESULTS IN SMALLER CUSTOMISED MOBILE SUBSTATIONS

Mobile substation technology has been used in South America for many years and WEG Brazil has an established reputation for the supply of this technology with an extensive footprint of successful installations. Zest Energy was responsible for bringing this technology to the African continent and since its first units were supplied to Eskom in South Africa, the company has expanded its solutions to include a wide range of mobile substations and mobile switching stations.

Coenraad Vrey, managing director of Zest Energy, says that the first mobile units engineered by the company in South Africa were mobile diesel generators and the company used this experience, together with the application of WEG's advanced technology, to engineer a mobile substation solution suitable for the harsh and demanding African conditions.

"What is particularly significant is that, with this mobile substation technology, it is possible to move these units to wherever they are required. This provides optimum flexibility, not just to power utilities, but also to other operations such as mines, quarries and rural areas," he adds.

Zest Energy leveraged WEG's 20 years of experience in engineering transformers to develop a transformer that has significant weight reduction. "This re-engineering was necessary to minimise both the weight and the physical size of the transformers. One way that we were able to achieve this requirement was by employing ODAF (oil direct air force) cooling," says Vrey.

He explains that an intimate understanding and knowledge of various applications means that the company is able to meet very specific requirements. "As an example, for a particular mobile substation for Eskom, we engineered a transformer with a low impedance value to comply with the project specifications, while still ensuring that the overall substation weight remained within the South African road ordinance requirements.

"We worked closely with the utility and in an effort to assist with the unit's operation we made use of offload selector switches to select the primary and secondary ratios. This was essential as previous technologies in place required that the transformer be opened and the links manually

changed inside the transformer. Our solutions resulted in savings in time and enhanced safety, with increased ease of operation,” says Vrey.

“Because these units are multi ratio and will be connected to different network operational voltages, we built technology into the control system that will ensure the correct voltage is selected, thus reducing any human error. The equipment has a comprehensive earthing system incorporating copper bars with connectors. This provides Eskom with different earthing interfacing points to which connections to the local earth system can be made. Similar, customised mobile substation solutions can be developed for utilities throughout Africa, all with an emphasis on fit for purpose practicality and safety,” Vrey concludes.

MOBILE SUBSTATION TECHNOLOGY PIC 01 : 132 kV/88 kV//33 kV/22 kV, 40 MVA multi-ratio mobile substation set up for transport mode and ready for deployment to the operational site.

MOBILE SUBSTATION TECHNOLOGY PIC 02 : Overall dimensions and weight distribution are critical requirements in any mobile substation design. Zest Energy utilised a combination of a dolly trailer and the main substation trailer to conform to all legislative requirements governed by the South Africa Road Ordinance.

MOBILE SUBSTATION TECHNOLOGY PIC 03 : Eskom’s technical teams and other interested customers listen closely to a presentation of all equipment and operational safety systems incorporated into the mobile substation design.

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