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**MARTHINUSEN & COUTTS CARRIES OUT CRITICAL STATOR REWIND
FOR N'ZILO HYDROELECTRIC POWER STATION IN THE DRC**

Marthinusen & Coutts, a division of Actom, is consolidating its role as an integrated electrical and mechanical services provider for the power generation and other industries in Africa, with its latest contract at the N'Zilo hydroelectric power station in the Katanga Province of the Democratic Republic of the Congo (DRC), operated by State electricity utility Société nationale d'électricité (SNEL). The contract included the stator rewind of a 30 MVA 18 pole vertical AC synchronous generator. "This power plant forms a critical component of the power generation network, not only in Katanga province but in the entire DRC, where electricity supply in general is under severe pressure," Richard Botton, Divisional CEO, Marthinusen & Coutts, says.

Located on the Lualaba River, N'Zilo was commissioned in 1958 to provide power to copper mines in the nearby Kolwezi region, but has only been intermittently operational since then due to ageing infrastructure. While Units 2 and 4 were refurbished, Unit 3 recently experienced a stator failure that necessitated urgent repairs. "Power is in short supply in the DRC's Katanga province, which is of critical concern to the mining industry in particular," Botton says.

"The rehabilitation of Unit 3 at N'Zilo became quite a critical element of the power projects within Katanga Province." Botton adds that while the average life of a stator is 25 to 30 years, those at N'Zilo had been operational for 40 years. "Generators usually run under arduous conditions, with a high demand placed on the machines, but they cannot run forever. N'Zilo was faced with both ageing and stressed infrastructure that ultimately was unable to cope with the demands being placed on it."

Due to the fact that N'Zilo is 50 km from the nearest town (Kolwezi) in difficult terrain and that the equipment is extremely big with the stator's internal diameter being over 5 m, the best solution was for Marthinusen & Coutts to carry out the repairs on site "as the most logical solution," Botton says. "In addition, we have the necessary equipment and skills in place in the DRC in order to carry out such repairs effectively." The scope of work was further complicated by the fact that it was a lap-wound stator as opposed to Roebel stator bars, requiring a high level of expertise. All this had to be accomplished in a very remote and isolated location.

Another factor that had to be taken into account by Marthinusen & Coutts was the testing conditions. Due to the different style and manufacturing discipline of the equipment in question, different testing equipment was required. “We had to purchase state-of-the-art Baker and PJ Impulse testers specifically for this job, with the understanding that this equipment would eventually be relocated to our centre of excellence in Cleveland, Johannesburg. Thus while the project entailed some serious decisions for us in terms of capital investment, it extends our overall capability and expertise, especially as we grow our business as an integrated electrical and mechanical service provider for both power generation and motors,” Botton says.

The project was very fast track due to the critical nature of the power supply in Katanga. “We commenced with the work in March this year and essentially completed the rewinding within seven weeks, with commissioning taking place in October. We had to ensure a long cure-off time because the overhangs were essentially in a raw state, which meant we had to build special temporary ovens for the curing.”

Botton ascribes Marthinusen & Coutts’ success with this project to its diligent planning and resources on the ground in the DRC. “We are well positioned to be able to carry out these types of critical projects, having access to all our resources in Johannesburg as well as our facility in Zambia.” He adds that upfront planning is essential to avoid later contingencies and manage costs. “We like to get everything organised, set a date and then carry out the project, whereupon we are able to mobilise rapidly in order to be able to tackle the next project.”

STATOR REWIND FOR NZILO PIC 01: Marthinusen & Coutts armature winders Wynand Willemse (seated) and Sheperd Chigwa (standing) inserting coils in the stator.

STATOR REWIND FOR NZILO PIC 02: Marthinusen & Coutts armature winders Sheperd Chigwa and Wynand Willemse with the completed stator.

STATOR REWIND FOR NZILO PIC 03: Marthinusen & Coutts armature winders Sheperd Chigwa and Wynand Willemse at the beginning of the rewind process, namely coil insertion.

STATOR REWIND FOR NZILO PIC 04: Marthinusen & Coutts armature winder Wynand Willemse pushing coils firmly into slots and inserting temporary wedges that retain the coils in the slot.

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