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Case Study : Class 230 Genset Cooling System Modification

Client: Train Operating Company

Challenge

We were approached by our customer to redesign a cooler group as the original design of the Class 230 Genset was causing significant operational challenges and was originally built using ex LUD stock which ran on third rail DC. Part of the conversion was the addition of 4 Gensets per train to create the electrical power required to power the traction motors.

The original design was inefficient and led to high operating temperatures, causing the Genset to overheat. This resulted in unexpected shutdowns, leading to a loss of traction power, delays and cancellations.

The overheating within the raft also caused the premature failure of key components, such as ruptured charge air coolers.

Our in-house rail engineering team were tasked with increasing the thermal dynamic properties within a compact Genset.

Solution

In total 24 Gensets were modified in-house at our Washington, Tyne and Wear facility. Four cores per Genset were manufactured in-house using an optimised aluminium plate and bar core to increase thermal efficiency. Modifications to the Genset frame were also carried out in-house for the four new radiators and three new cooling fans to be installed.

Additionally, modifications to all the Genset frames were carried out in-house to accommodate the four new radiators.

The cooler group arrangement was redesigned, relocating the cooler group and adding improved cooling cores for the water, charge air, and alternator coolers. Three new electronically controlled cooling fans have been installed, offering customisation options that allow the end user to set fan RPM speed, define specific operating set points based on coolant temperature, and adjust on/off duration.

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Benefits

- The client was satisfied with the job quality and redesign of Gensets, which optimised the thermal efficiency and improved in-service reliability
- The redesign of Gensets has helped to decrease the number of delays and cancellations previously caused by overheating within the system

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