CASE STUDY

THE POPPY LINE
NORTH NORFOLK RAILWAY

POSITIVE PROBLEM SOLVING

DURING A RESTORATION OF A VINTAGE DIESEL LOCOMOTIVE, NORTH NORFOLK RAILWAY (NNR) NEEDED AN EXPRESS INVERTER SOLUTION TO HELP KEEP THEIR PROJECT ON TRACK.

The NNR is often referred to as the Poppy Line, as 19th century poet Clement Scott famously described the area as 'Poppyland'. It offers a roughly 10 mile round trip through an area of outstanding natural beauty. Visitors can enjoy a ride on a historic steam train, stopping at picture postcard stations from a bygone era.

No longer used as a commuter route, today NNR offers customers a variety of train-based experiences on restored classic carriages. This includes murder mystery evenings, comedy dining and Christmas lunch among others.

Comfort is critical to events, with heating of the carriages a necessity. To achieve this steam is generated on the locomotive and piped through the carriages to warm the heat exchangers.

As the mass-produced locomotive boilers from the 1960s are no longer manufactured, a modern diesel fed equivalent was sourced. The new boiler required a 230Vac input to power its control electrics and water feed pump.

The locomotive had an on-board 30kW auxiliary generator, which provides power for various components at 110Vdc, such as the traction motor cooling blowers. Due to the mismatch in voltages, NNR needed a rugged DC-AC solution to ensure that the boiler could be powered.

Laurie Dickinson, Installation Engineer of the restoration said "The vibration and temperatures which the inverter could be subjected to meant that we needed a reliable and robust solution. ETPS provided this from their standard range."

> "THE VIBRATION AND TEMPERATURES THAT THE INVERTER COULD BE SUBJECTED TO REQUIRED A RELIABLE AND ROBUST SOLUTION. ETPS PROVIDED THIS FROM THEIR STANDARD RANGE."

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FULL STEAM AHEAD

While discussing key specification points, Laurie Dickinson explained “size was also a key factor. A power density of 2.7W/in³ of the 4kVA inverter meant that we didn’t have to go down the route of connecting multiple units in parallel - which would likely have added complexity and cost to the restoration.”

“The high efficiency of the inverter also means that most of what we put in we get out. This is imperative in our situation where the auxiliary generator could not be loaded much further.”

Dickinson further added “the fast lead time of the INV-P inverter and U.K. based technical support made the purchasing decision simple for NNR.”

First opening in 1887, NNR was originally part of a larger rail network of around 186 route miles. The route once stretched from Peterborough and Bourne in the west to Great Yarmouth, Norwich, and Cromer in the east.

In response to changing passenger patterns, the majority of the NNR was closed to the general public in the 50s/60s. Almost immediately preservation efforts started, which continue to this day.

The latest locomotive to be restored is the D5631, in which the INV-P inverter is installed. Entering the main Weyborne workshop in 2017, the D5631 is a Brush type two locomotive (later class 31) built in 1960.

Besides restoring the functional elements of the locomotive, the team are also treating it to a cosmetic overhaul to restore it to its former glory.

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D5631 BEFORE RESTORATION

HOLT STATION

ABOUT THE INV-P

Like all the inverters in our product range, the INV-P provides a true sinewave output. Up to 5 identical units can be operated in parallel for higher power and/or redundancy.

Load sharing is automatically distributed across all the connected inverters and the outputs synchronised.

Due to its exceptional reliability, the INV-P is used in many critical applications such as back-up systems in power stations and communication nodes.

A useful feature is that each unit is built with an overload capability of 150% for up to 3 seconds. This makes these inverters suitable for many motor type applications.

A small LCD screen tells you the status such as load and output. You can also adjust from factory defaults such as the under voltage protection levels.

Our inverter range starts at 125VA, with outputs of 115VAC or 230VAC. Redundant and modular configurations are possible up to 48kVA.

Besides standard models, different output frequencies and custom inverters can also be specified to meet a particular application if required.

If you’d like to discuss how the INV-P could power your critical applications, then please contact ETPS today.