

Steam power on track for great renaissance

Engineer's grand design for return to a golden age

by Jonathan Glancey

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St Pancras station, 2010. Eurostars snake out from under William Barlow's magnificent Victorian train shed to streak through the now densely populated "Thames Gateway" on their commonplace way, via the Channel tunnel, to a sophistication of European cities.

In between their departures, heads turn as another streamliner gallops away from the newly revamped Gothic station. This is a luxurious Pullman setting out on a tour of the peaks, moors and mountains of England and Scotland via the Midland main line. On its way it will cruise at 180kph, top 200 and draw more attention than David Blaine, the American illusionist, ever did in his dangling glass cage in 2003BE [Blair Era].

Why the fuss? Because our futuristic Pullman is a brand new steam train. At its head is the first of the £1.5m 5AT locomotives designed by the British steam engineer David Wardale. A handsome, highly-efficient 3,500hp machine, it is smaller but more powerful and much cheaper to run than any of its 20th century predecessors. This is New Steam in action. Unexpected. Commercially viable. Magical.

This week Alan Fozard of the 5AT Group presented technical and business plans for this new generation 4-6-0 steam locomotive at the first World Steam and Tourist Train Congress at Brienz, Switzerland. Delegates were shown designs for a machine that will transform the way passengers and railway management alike see the steam locomotive.

The 5AT will resemble a conventional Stephensonian steam locomotive, yet it will be neither smoky nor grimy. Yes, it will produce that familiar rhythmic beat, those plumes of white steam; its piston rods will race in and out of visible cylinders, and its tall disc wheels will be driven by a form of reciprocating motion invented by the Belgian engineer Egide Walschaerts in 1844.

Otherwise, it will be a very different machine, 100% more efficient than the finest steam locomotives of the 1950s when technical development of this much loved form of motive power hit the buffers. Only a small lineage of impassioned engineers in France (Andre Chapelon 1892-1978), Argentina (Livio Dante Porta, 1922-2003), and their disciples, David Wardale, Roger Waller and Phil Girdlestone in Europe, today continue the pursuit of modern steam.

"We haven't gone for a modern steam-turbine with a cab at both ends and electronic controls", says Mr Wardale, "because this would have none of the appeal of the traditional steam locomotive essential to its future commercial success. In any case, we don't want to build a one-off experiment that might go wrong. 5AT must work first time. It has to be simple and reliable. We have to convince railway managers that we are professionals with a practical proposition for an attractive machine that can keep pace with increasingly fast main-line trains.

"On a typical eight-coach train a 5AT will have much the same power-to-weight ratio as the Class 165 and 170 Turbostar trains you'll find on many inter-city services today."

Mr Wardale, a former British Rail engineer who went on to rebuild steam locomotives for the South African Railways in the 1980s - his South African Red Devil 4-8-4 was an outstanding success - plans to complete his detailed designs for 5AT early next summer.

Dr Fozard said: "The cost for the first locomotive, including design, development and testing will be £3.5m. Additional locos will be £1.5m, the same as a modern diesel.

"We are seeking investment and hope to have the first 5AT running in seven years."

"We'll take a neutral stance on the proposal", said a spokesman for EWS, the main-line freight company that operates existing mainline steam charters.

"Steam locomotives running on the main lines today must meet stringent safety standards. Some of them, like The Flying Scotsman, are 80 years old. They are allowed to run at 75mph. We'd have no problem, in theory, with a 200kph steam locomotive. Let's suck it and see.

"We've certainly no problem with crews; we have plenty of volunteers among our diesel and electric drivers."

"Many have tried to explain this love affair with steam" said Dr Fozard. "The fact is that it has driven the railway preservation movement from tiny beginnings 50 years ago to an industry that carried some nine million in Britain in 2000.

"We feel that the time has come for a new generation locomotive to ensure that steam trains continue to operate on a modernised rail network well into the 21st century."