

Institute of Railway Studies and Transport History
Universities of Birmingham, Sheffield and York
Developments in Modern Steam Traction for Railways
11 December 2006

A One-day Conference at the National Railway Museum in York
Walker and Alport Rooms

Conference Programme:

- 09:00 Registration and Coffee
- 09:30-09:45 Welcome and Introduction by C. Divall
- 09.45-11:15 Beyond Porta: New Front End Research (J.J.G. Koopmans)
(History of Front-End Research and Latest Developments)
New Build Steam in England: The A1 Project (D. Elliott)
- 11:15-11:45 Break for Coffee and Tea
- 11:45-13:15 Experience with Modern Steam and new Developments (R. Waller, DLM)
Modern Steam in England: The Design of the 5AT (D. Wardale)
- 13:15-14:15 Lunch in the National Railway Museum and Display of 'Fox' (I. Screeton,
Kirklees Light Railway, Huddersfield)
- 14:15-15:15 New Thinking on Fireless Steam Propulsion (H. Valentine and M. Bane)
Water Treatment for Modern Steam Locomotives (M. Bane)
- 15:15-15:45 Break for Tea and Coffee
- 15:45-17:15 Modern Steam on the Hauenstein in Switzerland (A. Haas)
Traction Cost Comparisons for Indonesian Coal Haulage (C. Newman)
Reconverting the Good Ship Spiez to Steam Operation (M. Schmid, ÖZL)
- 17:15-17:30 Closing addresses by P. Salvesen of Northern Rail and F. Schmid (RRUK)

Conference Chairs:

Colin Divall (IRS&TH), Robin Saunders (Sheffield) and Felix Schmid (RRUK)

Sponsoring Organisations:

Institute of Railway Studies & Transport History, University of York
National Railway Museum, York
Rail Research UK, University of Birmingham
Department of Mechanical Engineering, University of Sheffield

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Objectives of the Conference Organisers

The one-day conference on Developments in Modern Steam Traction for Railways is aimed at showcasing recent research and technical advances in railway steam traction for commercial use in appropriate applications. Colin Divall and Felix Schmid initiated this event in order to disseminate the results of Dr. J.J.G. Koopmans' ground-breaking research into the front end design of steam locomotives and to promote current work on modern steam traction that is taking place in a number of European countries and South America. It is hoped that the speakers and audience will engage in fruitful debates on the future direction of new and modern steam traction.

'Developments in Modern Steam Traction' is targeted at railway engineers and managers working in a professional capacity in today's railway industry and in heritage operations. The conference is intended to raise their awareness of current developments in modern steam traction, the opportunities and limitations.

The Contributions

Colin Divall will introduce the conference and will set the scene for the conference, adopting the perspective of the historian of technology.

Jos Koopmans studied at the Universities of Delft and Sheffield and presented his doctoral thesis 'The fire burns much better...' (quoted from Trevithick) at the University of Sheffield in autumn 2005. His theoretical and practical studies have led to a substantial extension of the work of Chapelon and Dante Porta and have resulted in guidelines for good practice in front end design. Jos will describe the history of front-end research from its earliest days at the beginning of the 19th century to the work of Porta in Argentina. He will then outline the conclusions from his theoretical studies and will describe the results of the tests he undertook with the RTM54 locomotive in Holland.

David Elliott will report on the ongoing construction of the replica A1 locomotive, including the production of the boiler, and will update the audience on the current status. He will highlight the difficult compromises that must be accepted when recreating a historic locomotive so that it satisfies modern standards of safety and environmental performance.

Roger Waller of Dampflokomotiv und Maschinenfabrik of Switzerland will outline his company's experience with building modern steam locomotives and a new steam engine for the 'Montreux' lake steamer, operating on Lake Geneva. He will also discuss recent projects and plans.

David Wardale will present a technical paper on the design of the 5AT project, aimed at producing a modern high performance steam locomotive for mainline tourist trains and special applications. He will outline the major technical advances that will be incorporated in the design to satisfy modern safety and environmental regulations and to achieve sustainable success in commercial operation.

Harry Valentine will outline current thinking on the use of stored steam in traction applications, with a particular focus on the availability of process steam and appropriate industrial applications of the technology. Martyn Bane will present Harry's paper and will also discuss his own work on taking forward Porta's ideas on water treatment for modern steam traction and its benefits.

Alfred Haas will present a Swiss view respectively on the potential role of modern steam traction in enhancing the attractiveness of community railways and in revitalising branch lines. Chris Newman has conducted a major study of the economics of coal traction for the haulage of coal in Indonesia, based on a detailed analysis of such operations in China. In a joint paper by DLM and Ökozentrum Langenbruck, Martin Schmid will discuss pellet firing of steam engine boilers, using the example of the steam ship Spiez project. This follows on from DLM's re-conversion of the Lake Geneva passenger ship Montreux to light-oil fired steam operation.

Paul Salveson from Northern Rail will provide a closing summary, commenting on the relevance of the day's proceedings for today's railway industry and, in particular, community railways.

Conference Proceedings

Conference proceedings, including technical papers by the authors, will be published jointly by the Institute of Railway Studies and Transport History and by Rail Research UK after the conference in paper form and will be dispatched to delegates at the address given on the registration form.

‘Fox’ of the Kirklees Light Railway

The Kirklees Light Railway, a 15” (450 mm or so) narrow gauge railway based in West Yorkshire, has kindly agreed to display its locomotive ‘Fox’ at the National Railway Museum on the day of the Conference. Inspired by Porta and Wardale, Ian Screeton has made improvements to ‘Fox’ that include Porta’s Gas Producer Combustion System; a multiple jet blast nozzle; chimney diffuser; increased blast nozzle area and cylinder insulation.

The results of the modifications have been fuel reduction; increased power; extended periods between washouts; absence of clinker; reduction in smoke; reduced maintenance, better performance overall.

Details of the 2-6-2 tank engine ‘Fox’:

Built:	1990, by Brian Taylor
Length:	3.76 m
Height:	1.66 m
Width:	1.105 m
Weight:	3.5 t (with average supplies)

