

Foreword



Gas turbines have become one of the most important engine types for electric power generation on a global scale – either as simple cycle installations or to a rapidly increasing extent as part of combined cycle power plants. This development is the result of many inherent advantages of this technique in comparison to alternatives – not the least its superiority in the category of cost of electricity.

During more than a century engineers of the Swiss development centre of A.-G. BBC Brown Boveri & Cie., from 1988 onwards ABB Asea Brown Boveri Ltd. and since 2000 Alstom Power Ltd. in Baden, Switzerland have significantly contributed to the achievement of today's advanced gas turbine concept and its successful integration in combined cycle applications. The present book provides a comprehensive and detailed insight on both technical and business aspects of the long-term genesis of this unique high technology product. This rather rare description of the development history of a thermal turbomachine puts also special attention on the human touch – a characterisation of leading engineering personalities of the time and the corresponding teamwork; triumphs and drawbacks accompany this fascinating professional account over decades – from a Swiss company nucleus of less than thousand to a global industrial company with several ten-thousands of employees. Numerous historical 'firsts' in gas turbine technology for power generation are highlighted – as summarized in Section 7.1 – ranging from the first realisation of the industrial, heavy-duty gas turbine in the 1930s to today's high technology gas turbine products, which combine excellent performance, extraordinary low environmental impact with commercial attractiveness.

Twenty years after Ernst Jenny's commendable book on 'The BBC Turbocharger' follows now the 'Gas Turbine Powerhouse' with a comprehensive description of gas turbine developments for power generation at BBC-ABB-Alstom. The book outlines not only the corresponding activities in gas turbine design and related disciplines, but covers also the historic development milestones of the major components – axial compressor, combustor, turbine and turbine cooling; the latter area with surprising, so far unknown revelations. The author Dietrich Eckardt provides a rather rare combination of technical and historic-economic insight, using engineering experiences of more than 40 professional years in turbomachinery research and gas turbine development, both for aero and power generation applications. The inclusion and thorough assessment of a broad variety of new sources and archive materials unveiled many interesting details of the gas turbine history, not the least surprising connections during the early parallel development of industrial and aero gas turbines. On Friday 7 July 1939, 10.10 h started at Baden, Switzerland the full load certification test of the first power generation gas turbine for the utility plant at Neuchâtel, Switzerland – the first step of what has become a global success story and as such, a well-documented cause to celebrate this key event 75 years ago. This plant remained in service for 62 years – not bad for the first such order ever. The book provides the details to understand this engineering 'miracle', at best for the pride of present and the encouragement of future generations of engineers in this fascinating field of advanced technologies.

Baden, June 2013
Juerg Schmidli

Since J. Schmidli's Foreword the industrial gas turbine world and the related historical assessment changed under aspects, worth to be mentioned in this 3rd edition:

2014 After a complicated bidding process,¹ the Alstom board accepted a GE bid for its energy division on 21 June 2014. Instead of finishing the deal as planned in early 2015, the EU Competition Commission started to examine the deal, and finally approved it in September 2015, subject to the divestiture of Alstom's large gas turbines (GT26 and GT36 models) development, manufacturing and in parts service business to the Italian Ansaldo Energia.

Lenzerheide, January 2025
Dietrich Eckardt

¹ See Wikipedia 'Alstom' in English.