

## Michael Bowness

<b>Qualifications</b>	BSc Special Honours Chemistry, University of Hull
<b>Affiliations</b>	Chartered Engineer Fellow, Institute of Materials, Minerals and Mining (UK) Fellow, Coke Oven Manufacturers Association (UK) Former Assessor, European Foundation for Quality Management
<b>Year of Birth</b>	1943
<b>Nationality</b>	British
<b>Languages</b>	French "O" level, some German, Japanese and Malaysian
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### Current Position at CWA

External Consultant to the Metals & Minerals Department

### Specific Expertise and Experience at CWA

Former Senior Operations and Technical manager of British Steel with over 35 years' extensive international experience of steel industry production and quality control. Wide experience base in the Technical, Operational and Commercial aspects of Iron and Steelmaking, including associated Raw Materials.

### Summary of Previous Employment

#### 1999 to date

Iron and Steel Consulting Engineer

- Consultant to Mitsubishi Corporation Tokyo, Carbon Department. Assisting sales and marketing team with the purchase and sale of coke products.

- Retained by Clyde Materials to promote the Clyde/Corus Coal Injection Technology for Blast Furnaces in India and the Far East.
- Interim General Manager – SC Remayer SA – A scrap processing company in Bucharest. This EBRD project involved assisting a new company to develop successfully in the “Market Economy”.
- Consultant to Kirloskar Ferrous Industries, India, providing Technical guidance to improve the performance of their mini Blast Furnace plant.
- Involved in a viability study at an Iron Works in Georgia, FSU (2003/4); Ironmaking expert for Business Plan preparation for an Iron and Steelworks in Siberia (2004); Ironmaking team leader in a cost reduction/benchmarking study in Russia 2004; carried out audit of a Cokemaking Plant in Poland 2004 (for Mittal Steel); carried out a review of a business plan for a proposed new ferrosilicon production plant 2004/5; assisted a Major Steelmaker (Mittal Steel) in assessment of a new coal mining venture in Australia 2005; coke and iron team member advising a would be purchaser looking to buy Pakistan Steel Corporation (privatisation) (2005/2006); carried out due diligence studies for 3 Ukrainian Cokemaking/Ironmaking plants (2006 and 2009); undertook a viability study at an iron and steelworks in North Korea (2006); due diligence study for a Pellet Plant in Middle East 2007 producing DRI grade pellets; two due diligence studies carried out for Chinese EAF Stainless plants in China (2007); audited two large BF plants in China and gave technical advice on coal injection/oxygen enrichment (2008); involved in review of FASTMET/FASTMET project (2008); carried out due diligence on a Silico-Manganese Plant in Georgia (FSU) (2010) and provided advice on project development; value-in-use assessment of a new Australian Iron Ore to support marketing of that material (2007); provided Ironmaking and Technical marketing expertise to a Global Iron Ore and Coal Mining Company 2008/14; carried out VIU assessments of many iron ores and coals and advised on marketing strategy for a major trading company 2011/12;
- Produced a “Mini thesis” on the Technology trends which are likely to occur in the Iron and Steel Industry to 2030 for a large international company (2008/09); this included review of new Ironmaking technologies, development of Electric Arc Furnace steelmaking capacity, development of Direct Reduced Ironmaking (DRI) capacity to augment limited scrap availability, development of new Steelmaking processes; particular emphasis was given to the influence of environmental matters and climate change;
- Undertook more than 25 Expert Witness assignments 2003 – 2015 in the Iron and Steel sector – two of which involved shipments of Tubes and Pipes. I have given evidence at an International Tribunal on 3 cases.

**1997-99**

**Gunawan Iron & Steel, Kemaman, Malaysia**

Operations Director

This project, suspended and subsequently closed due to effects of Far East currency crisis in 1998/99, included BF/BOS/Slab Casting Machine and Plate Mill with a design output of 1.35 mt/a . My involvement included:

- Performance and Product Development at Plate Mill (Operational Jan 97).
- Pursued slab quality complaints with Indian slab supplier
- Development of recruitment and training strategy
- Advertising, interviewing and identifying staff for operational phase.
- Development of process strategy and cost structure.
- Establishment of coke, sinter and lump ore supply strategy/agreements.
- Finalisation of equipment/process design.
- Pre-sales visits to potential customers for Steel Slab in USA and Asia
- Establishment of Environmental Policy with Malaysian Authorities.

**1996-1997**

**British Steel, Teesside Works**

Manager, Special Projects

Managed the Technical Development programme with Nippon Steel Corporation. Collation and analysis of Iron and Steelmaking data worldwide for database development.

**1993-1996**

**British Steel, Teesside Works**

Works Metallurgist, Teesside

- Chairman of the Works SPC Steering Committee (250 schemes).
- Established the Works Task Team Steering Committee and working methodology. Savings totalled £12m in two years.
- Played a central role in the continued development of QA procedures. (Teesside works achieved the Japanese standard JIS in 1995).
- Improvement of “through yield” from Steelmaking to sold product. EFQM European Assessor. Played prominent role in developing “self-assessment” at Teesside Works.
- Guided Technical investigation into Redcar Blast Furnace Hearth Temperature variations and the identification of control measures.
- Increased scrap consumption on BOS from 12% to 18%, improving works output by 200 Kt/a.
- Led Coil Plate Mill task team to achieve “scale free” surface quality and reduce customer complaints. Played a major role in improving segregation characteristics in continuous cast slab and steel products.
- Developed Jumbo Beams route based on large ingots (up to 35 tonnes).
- Played a key role in waste recycling. Waste products to landfill reduced to 7% of 1985 level.
- Centrally involved in the development of a Divisional Competitor database.

**1990-1993 British Steel, Teesside Works**

Technical Manager, Steelmaking

- Development of new Steelmaking routes (particularly secondary Steelmaking) – using Ladle Furnace, RH degasser, Scan lance injection and Argon stir stations) to allow high quality steels to be produced for the Oil and Gas sector, Armour plate, Automobiles, etc. These developed steelmaking routes were in part related to development of improved Linepipe and Casing Steels for the British Steel Hartlepool Plate Mill.
- Achieved a substantial improvement in product hydrogen level/control.
- Developed improved slag formation and de-phosphorisation procedures whilst simultaneously reducing slag volume.
- Centrally involved in developing steelmaking and continuous casting practices to meet demands of British Steel Strip Products and Dalzell Plate Mill, following the decision to close the Ravenscraig Steelworks and transfer order load to Teesside works.
- Audited Azovstal Continuous Casting plant in support of a proposed slab purchase agreement (British steel proposing to buy Azovstal slabs).
- Developed casting practices for 35 t ingots for Jumbo Beams/Columns.
- Identified need for Tank degasser for improvement in analysis capability.
- Introduced new Customer liaison meetings to drive for continuous improvement in performance.
- Developed Concast slab enhancement scheme in conjunction with the Production department.
- Developed new market for BOS slag in Agriculture.

**1989-1990**

**British Steel, Scunthorpe Works**

Acting Chief Metallurgist

- Guided Scunthorpe Works iron ore and coal raw materials development, achieving substantial cost reduction and lower iron sulphur content.
- Led task force to increase Concast output.

**1981-1989**

**British Steel, Teesside Works**

Technical Manager Ironmaking

- Major input to new Redcar Coke Ovens design/rebuild. These ovens became world benchmark standard for quality, productivity, cost and environmental standards.
- Developed new QA system for all Ironmaking processes.
- Played key role in developing coal and iron ore blends for Cokemaking and Sinter production.
- Centrally involved in developing operating practice in all ironmaking departments.
- Played a major role in improving Blast Furnace performance to world standard. Jointly Awarded the Institute of Materials Colclough Award.

- Undertook many diagnostic investigations to correct abnormal Blast Furnace behaviour, e.g. Blast Furnace chilled hearth investigations; Burden distribution analysis and development; Analysis of trends in Blast Furnace Hearth temperatures and implementation of corrective action programmes; improvement of Burden Materials Quality to improve Furnace Operations.

**1975-1981 British Steel, Teesside Works**

Works Manager Cokemaking

Steered the development of Cokemaking at a time of great change; this work included:

- Rescue of damaged South Bank Coke Ovens; this plant is still working more than 30 years later as a result of ongoing maintenance programme on Ovens and By-Product Plant.
- Closure of old Cleveland Coke Oven Plant.
- Commissioned and operated the coal preheat/pipeline charging processes at the new Redcar Coke Ovens. These new Technologies failed – as with all other plants which adopted the process – and the ovens were rebuilt.
- Development of world best coke quality at much reduced cost (down 30%).

**1973-1975 British Steel, Workington Works**

Works Manager Steel

- Responsible for Bessemer and EAF Steelmaking and two Rolling Mills.
- Supervised the controlled run-down and closure of Steelmaking.
- Commissioning of new Walking Beam Reheat Furnace sourced with Blooms from Teesside Works

**1970-1973 British Steel, Workington Works**

Manager, Steelmaking

**1970 British Steel, Workington Works**

Assistant Manager, Steelmaking

**1969 Bessemer Process Control Scheme**

Systems Analyst

**1964-1969 Workington Iron and Steel Company**

Assistant Metallurgist in Process Metallurgy section

Bessemer and Arc Steelmaking, Rail Rolling and Finishing. Developed Oxygen blowing in Acid Bessemer plant, developed Ingot balancing theory, substantially improved Rail Steel surface quality.

## Other Points

- Many years' service as a member of British Steel Teesside Works Management Committee.
- Throughout my career I have made a major contribution to cost reduction/performance and profit improvement.
- Responsible for developing and controlling BS Teesside Works Process Research Budget (45 man years).
- Played a major role in recruitment and development of Management/Staff for Technical and line vacancies at all levels.
- Major involvement in training BS Managers and Managers/Executives from other International Steel Companies.
- Major involvement with Customers and Inspection/Auditing bodies.
- Detailed understanding of Costing and Technical performance on an International level.
- Visited and/or worked on Coke/Iron/Steel Plants in Germany, Luxembourg, Belgium, Canada, France, Netherlands, Italy, Norway, Finland, Austria, Ukraine, Poland, Romania, Georgia (FSU), Russia (West), Russia (Siberia), USA, Japan, Australia, China, Malaysia, Indonesia, India, Thailand, Philippines, South Korea, Turkmenistan, Brazil, Bahrain and North Korea.

## Patents / Publications

Written and presented many papers for National and International conferences; subject matter includes Cokemaking, Ironmaking, Steelmaking, Statistical Process Control and Total Quality Management.

## Papers Presented at Conferences

- Iron and Steel – Present, Past and Future; Cleveland Industrial Archaeological Society; 2010
- Regional and Global Implications of China's Spectacular expansion in the Steel Industry; S.E. Asia Iron and Steel Institute (SEAISI) 2008
- Evolution in the Iron and Steel Business – What ASEAN companies can do to survive and prosper; SEAISI conference 2008
- The Injection of Granular Coal into the Blast Furnace; M. M. Bowness, M. Chisholm and C. Notman; SEAISI conference 2004
- An Organisational Approach to Effective Statistical Management, Process Control (with S Ravindran, D Laight), 1<sup>st</sup> World Congress for Total Quality, 1995
- Competitiveness through Innovation – the British Steel Experience, European Research and Technology Fair, 1995
- Iron to Steel – Managing the Interface, AIME Ironmaking Conference, 1994
- The Production of High Purity Steels at British Steel Teesside Works, European Oxygen Steelmaking Congress, 1993



- Steel 2000 – ‘Whither or Wither’, Presidential Address, Cleveland Institution of Engineers, 1992
- Coke Handling at Redcar Works; Steps to Improve Bell Coke Yield; The Blast Furnace Route to Pig Iron, British Institute of Foundrymen Conference, 1989
- Coke Quality Investigations and Developments within British Steel, European Blast Furnace Committee, 1989
- A High Proportion of Lump Ore, International Iron & Steel Institute Conference on Ironmaking Burdens, (with J E Parratt), 1988
- Sinter Quality Developments at Redcar Sinter Plant, 1987
- Developments in Ironmaking Practice at the Redcar Blast Furnace, Cleveland Institution of Engineers, 1986
- Coal, Coke Oven Operations at Redcar, Institute of Materials Conference, 1977
- The Control of Nitrogen in Bessemer Steel, West Cumberland Metallurgical Society, 1969

### **Other Published Papers**

- Ferritic Rolling: The Metallurgy and the Economics, 2000
- The Application of Statistical Process Control (with S Ravindran, D Laight), 1994
- The Application of SPC to Ironmaking Operations at BSC Teesside Works, 1988
- Coke Quality for Successful Blast Furnace M M Bowness et al Operation, Iron and Steelmaking, Vol. 14, 1987
- Developments in Ironmaking Practice at the M M Bowness Redcar Blast Furnace, 1986
- Preheated Coal Operations at Redcar Coke Ovens (with JP Guerin), 1984